





Map of
INDIA;
Shewing the
Military Divisions & Stations
UNDER THE
THREE PRESIDENCIES.

N.B. Where European Troops are stationed the Place is underlined with Red
with Yellow.

0 100 200 300 400 500 600 700
English Miles

RESEARCHES
INTO THE
CAUSES, NATURE, AND TREATMENT
OF
THE MORE PREVALENT
DISEASES OF INDIA,
AND OF
WARM CLIMATES GENERALLY.

ILLUSTRATED WITH
CASES, POST MORTEM EXAMINATIONS,
AND NUMEROUS COLOURED ENGRAVINGS OF MORBID STRUCTURES.

By JAMES ANNESLEY, Esq.
OF THE MADRAS MEDICAL ESTABLISHMENT,
LATE SURGEON TO THE MADRAS GENERAL HOSPITAL, M.R.C.S. AND M.R.A.S.

IN TWO VOLUMES.

VOL. I.

LONDON:

PRINTED FOR
LONGMAN, REES, ORME, BROWN, AND GREEN, PATERNOSTER ROW;
PARBURY, ALLEN, AND CO. LEADENHALL STREET; T. AND G. UNDERWOOD, FLEET STREET;
AND TREUTTEL AND WÜRTZ, TREUTTEL, JUN. AND RICHTER, SOHO SQUARE.

M.DCCC.XXVIII.



TO

THE HONOURABLE

THE COURT OF DIRECTORS OF THE EAST INDIA COMPANY,

&c. &c. &c.

THIS WORK,

PUBLISHED UNDER THEIR AUSPICES AND LIBERAL PATRONAGE,

IS MOST RESPECTFULLY INSCRIBED,

BY THEIR DEVOTED AND OBEDIENT SERVANT,

JAMES ANNESLEY.

P R E F A C E.

WITHOUT attempting to shew how much a similar undertaking to the present has been a desideratum in medical science, and more particularly to those who are connected, in a professional point of view, with India, or intertropical Countries generally,—a point on which every medical man can decide without the assistance of the Author,—he will briefly state the circumstances which have given rise to his Work, as appearing to him the best mode of conveying an idea of its scope and object to the professional reader.

During the greater part of twenty-five years' practice, in which his opportunities of acquiring professional experience were unusually extensive, over almost every part of India,—under all circumstances and situations of intertropical service,—in charge of large general hospitals at fixed stations,—in field hospitals on actual service,—in regimental hospitals, moving over various countries and through different climates,—amongst Europeans as well as natives,—and among men, women, and children, in all classes of the community, public and private—the Author has taken notes of the symptoms, progress, and

treatment, of the diseases which came under his superintendence. These notes were regularly preserved, and arranged, with suitable indices appended to them, for the convenience of reference; so that he could readily refer, when occasion required, to the daily and hourly reports of the state and treatment of any individual case under his charge, at any period from 1811 to 1824.

The Author considered these reports valuable, inasmuch as they furnished a faithful and copious history of the numerous cases which came before him, particularly those which presented features of interest, and in which the effects of particular remedies were tried, or certain modes of treatment pursued. He also presumed to think, that the value of these cases was not diminished by the circumstances of their having chiefly occurred in public hospitals of which he had the charge, and of their progress having been attentively watched, and some of them treated, by well-educated and intelligent medical officers who served under him at the time. Nor will their interest, he trusts, be impaired by their containing observations on the state of the patient, the nature of the disease, and the treatment adopted, noted at the bed-side of the patient, and at the time the impressions were first made upon his mind.

In India, the medical practitioner has every possible opportunity of investigating disease by *post mortem* examinations, and of connecting the symptoms and treatment with those morbid changes which take place in its course. To this subject the Author has always paid especial attention: but the great difficulty of describing morbid structures, and the impos-

sibility of preserving the natural appearances in the way morbid preparations are usually made, led him to cause Drawings to be executed of the more interesting and remarkable changes produced upon the internal organs by the diseases he was called upon to treat. Circumstances placed in his power the means of accomplishing this object, and he fully availed himself of them. *Post mortem* examinations necessarily take place in warm climates soon after death, and before the capillary circulation in the internal organs has undergone that change which is experienced after a few hours, or before the blood has returned from the minute arteries into the venous trunks. Thus, the warmth of the climate has indirectly enabled him, it may be presumed, to give a more correct delineation of the appearance of diseased structure than could otherwise have been obtained. The knowledge unfolded by this circumstance induced him to follow up the indications to which it pointed; and as an early examination of the subject of disease after death appeared necessary to accurate ideas as to the more minute changes and finer shades of disorder, impressed upon the different internal viscera during life, it was never neglected when it could be practised with propriety.

The Drawings, thus made under the eye of the Author, and coloured from the recent subjects before him, accumulated with his reports. From these reports and representations of morbid structures he has drawn largely in the performance of his undertaking. As to the execution of the Drawings he thinks it unnecessary to offer an opinion; but for their correctness, as respects the morbid changes they display, and the accuracy of the colouring, he holds himself respon-

sible. They were not originally intended for publication; but since the Author's return to England he has been repeatedly urged to give publicity to them, in the hope of applying morbid anatomy to the treatment of internal disease, as it has been so successfully applied to the improvement of surgery. This, however, would have been totally out of his power but for the liberality of the Honourable the Court of Directors of the East India Company, who have, in the most handsome manner, enabled him to bring out his Work in the present form. It is the Author's highest ambition and most anxious hope, that the Work may be useful to their service in India, and to intertropical practitioners generally, and prove deserving of the high patronage and liberality of the Court.

There are many deficiencies in that part of his Work which treats of the medical topography, climate, and seasons of India, particularly as respects some of the districts under the Bengal and Bombay Presidencies: these the Author is well aware of; and he earnestly solicits his medical brethren, in India, to enable him to correct any errors he may have fallen into, or to supply what it has not been in his power to command. He will receive with thankful acknowledgments whatever information they may kindly afford him; or if they shall follow up what has thus been so imperfectly commenced, he will feel equally gratified. It is only by the united exertions of the Profession, in different parts of the world, that medical knowledge can be really advanced; and it would be vain in any one man to attempt more than his own experience and observation authorised. To the public services the members of the Profession have a right to look for

practical facts which shall enable them to extend their knowledge—shall dispel the obscurity that too frequently involves them in difficulties, and open to them distinct and correct views of disease; but in the investigation of those facts the mind should not be warped by prejudice, or cramped in its exertions by trifling distinctions, and the recognition of forms which are of no essential value in practice. Intimate and enlarged ideas of every subject connected with medicine should be entertained; what is essential and important should be distinguished from what is fortuitous and trivial, and the science cultivated as first amongst the highest departments of human knowledge—as being the application of numerous branches of study to one great end,—the alleviation and removal of human suffering, and the prolongation of human life. In this point of view, there is not a nobler study,—there certainly is none which displays a more ample field for the exercise and improvement of the powers of mind.

The want of precise information as to the treatment of disease on first arrival in India, has been felt by every person who has visited that country, and by none more than the Author. The rapidity with which morbid actions run their course in warm countries calls for the most decided treatment,—there is no time in the acute disorders of those climates for speculation,—they must be decidedly met, to be successfully combated. This is very soon discovered by the practitioner;—but, until the discovery is made, the Author has seen the most enlightened involved in doubt and difficulty. The boldness with which many of the Cases detailed in this Work are treated, may surprise the practitioner in more temperate countries, where

disease is much slower in its progress than it is in warm climates. But in India, if disease be not checked at its commencement, and before it has established itself in the structure of vital organs, either the patient is lost, or that organic derangement is produced which makes him a burden to himself, and useless to the public service or to society. Decision in the treatment of intertropical maladies, however, in order to be beneficial, or even to be devoid of mischief, must be the result of precise and accurate ideas of their nature and causes: these are chiefly to be acquired by close and attentive observation at the bed-side of the patient. The nature and extent of the measures to be pursued, and the application of them to the various periods or stages of disease, and to the peculiarities of habit and constitution, must depend upon the intelligence, discrimination, and tact, of the practitioner, who should know when to confide in the operations of nature, and when to be decided in the employment of the resources of art: and as this is one of the first features in the character of a good and enlightened physician, so the acquisition of it should be the object of every medical man's ambition.

The numerous Cases in the present Work, which have been faithfully transcribed from the hospital diaries, will demonstrate the nature of acute diseases in India, and, it may be presumed, within the tropics generally. The success of the decided practice recommended by the Author, may be inferred from the subjoined table of admissions and deaths in the hospital of the Madras European regiment, for four years and a half, during which period this regiment was stationed in various climates in India; and from the accompanying state-

ment of admissions and deaths in the Madras Hospital, whilst he was in charge of that Institution.*

* *Table, shewing the Result of Treatment in the Madras European Regimental Hospital, from January 1813 to June 1817 inclusive.*

Stations of the Regiment.	Effective Strength.	Admitted into Hospital.	Died.	
1813 at Wallajahbad	417	708	6	{ The regiment arrived at this station from Vellore.
1814 Ditto	541	767	14	
1815 Trichonopoly	600	1069	16	{ Part of the regiment were on field service from January to June. Marched from Trichonopoly in August, and arrived at Kurnoul 15th Oct. 1816. Marched from Kurnoul 19th April, and arrived at Hyderabad the 2d of May, 1817. The thermometer during this march was never under 100°, generally 110° to 116° in the coolest tents. The march was most distressing to all concerned.
1816 Ditto and Kurnoul	825	1799	37	
1817 (30th June) Ditto and Hyderabad	1005	1099	22	
Total	3388	5442	95	

N.B. — The deaths in this statement (which are in the proportion of 1 to 42 in the effective strength, and 1 to 57 in the number of admissions) will be found to differ from the tables given in our Sketches of India, (page 364), — a circumstance which requires explanation. The deaths enumerated in this table took place at the head-quarters of the regiment, under the immediate charge of the Author; — those in the tables alluded to were taken from the regimental returns, and include all deaths which have taken place in detachments from the regiment, and among absent sick.

Abstract Statement of the Total Number of Persons, Europeans and Natives, Women and Children, admitted into the General Hospital at Madras, from April 1819 to the 30th June, 1823, inclusive; i. e. Four Years and Eight Months, during which Period the Establishment was under the Superintendence of the Author.

Admitted.	Discharged.	Dead.	1 Death in 14 Admissions.
4953	4590	355	

A great number of bad cases of Fever, Dysentery, and Liver Disease, were received into the hospital in their last stage; others were sent from regimental hospitals at out stations, sometimes for change of air, but more generally for the purpose of embarking for Europe those who were invalided, from bad health and broken constitutions. Many of these latter cases have been treated in this hospital; and it was upon this account that the Author stated, in his reports upon the diseases of the different divisions of the Madras army, that the proportion of hepatic diseases in the returns of the Presidency division, being so much greater than either the centre or southern division, ought not to be imputed to the climate of Madras, but to the circumstance of a large proportion of these cases being sent from out stations of the army to the Presidency General Hospital.

The Author has confined his views to the facts that came immediately under his observation, in a very extended field of practice; and it is gratifying to find, that many of those facts have been confirmed by the most enlightened and respectable writers of the present day, whose works he has consulted, and whose names and publications he will enumerate at the end of his Work, as references to those who may wish to pursue the subject further. He has also endeavoured to observe the varied phenomena of intertropical maladies, and to mark those symptoms that have escaped the attention of others, whose opportunities have been neither so varied nor so extensive as those which he has enjoyed; and he has ventured to confirm or reject, by practical observation, the different opinions given upon these subjects. To this end he has sedulously watched disease throughout its course; and when it proved fatal, compared the symptoms while living with the appearances after death, noticing any omission that appeared to have been made in the treatment, and endeavouring to correct it upon every future occasion. This plan he has followed uninterruptedly for many years, and it gave him a facility of noting differences in cases, and detecting symptoms, which has proved of much value to him in the course of his service.

The Author regrets exceedingly that it has not been in his power to enter so fully as he could have wished into the opinions of those who have preceded him, and to whom the Profession are so much indebted: and he takes this opportunity of offering that deference which he feels is due to those authors who are well entitled to his respect and admiration. He trusts he will not be charged with undue

confidence, in stating his own opinions fairly and freely, to the apparent neglect of their views, as he has no other object in this publication than an anxious wish to render his experience useful to those who may follow him.

During the short period he has had to complete his Work, being obliged to return to India almost immediately, he has endeavoured to collect as many facts as he could bring within his reach; and whatever may be found wanting, he entreats his medical brethren in India to assist him in supplying. He is fully aware that there are ample sources in India, of most important information on medical subjects generally, and on the diseases resulting from climate particularly, and many more competent than himself to the task of informing the Profession respecting them. The Navy and Army Medical Officers have already contributed largely to the advancement of medical science: the results of their experience in their particular spheres of observation, cannot fail of proving still further useful to the public service of the country and the community at large. It is to be hoped, therefore, that they will add to their valuable labours by continuing to furnish the results of their observations to the public. They have before them the examples of Pringle, Cleghorn, Jackson, Blane, and many others, to emulate. The works of these eminent Physicians have long held a conspicuous place among the medical writings of modern times; and they still deserve to be consulted with confidence and respect.

The Profession are much indebted to Sir James M'Gregor, Director-General of the Army Medical Department, for the

very active and useful part he has taken in encouraging medical literature in His Majesty's military service in all quarters of the globe; and the zeal and talent with which he continues to devote himself to the improvement of the medical department of the army, will, assuredly, prove both advantageous to the Profession, and most beneficial to the service. The Author is under great obligations to him for liberal access to the valuable records in the office of the Army Medical Board; and from which he has constructed the Tables contained in APPENDIX, No. III.

The Author has now stated, as concisely as possible, the sources of his experience: it only remains for him to remark, with regard to the object of his Work, that he has been induced to undertake it by an anxious desire of contributing useful facts to the great mass of information daily coming before the medical public, and of being useful to medical men proceeding to India and other warm climates, and to the European community residing in them. His errors will be beacons to others, enabling them to avoid similar mistakes to those into which he may have fallen; and his success will convey information and confidence to the inexperienced practitioner. If either of these objects be gained, he will feel amply rewarded for much trouble and anxiety during a very long and laborious service.

LONDON, 17th January, 1828.

CONTENTS.

	PAGE
PREFACE	vii

BOOK I.

PRELIMINARY OBSERVATIONS	1
--------------------------------	---

CHAPTER I.

REMARKS ON THE DIGESTIVE AND ASSIMILATING FUNCTIONS.....	10
OF THE PROCESSES OF MASTICATION AND DIGESTION.....	11
OF THE FUNCTIONS OF THE LIVER, PANCREAS, AND SPLEEN.....	22
OF THE FUNCTIONS OF THE DUODENUM AND SMALL INTESTINES	33
OF THE FUNCTIONS OF THE CÆCUM AND LARGE INTESTINES.....	36

CHAPTER II.

GENERAL VIEW OF THE CAUSES CHIEFLY PRODUCTIVE OF DISEASES IN WARM CLIMATES, PARTICULARLY IN INDIA	45
OF THOSE CAUSES OF DISEASE WHICH PROCEED FROM THE SOIL, SITUATION, AND VEGETATION OF A COUNTRY.....	46
OF THE SOILS AND SITUATIONS PRODUCTIVE OF MIASMATA, AND CIRCUMSTANCES FAVOURING THEIR GENERATION	47
OF THE NATURE, PROPERTIES, AND EFFECTS OF MIASMATA, AND ON THE MANNER IN WHICH THEY INVADE THE SYSTEM	74
ON THE EFFECTS OF MALARIA ON THE HUMAN CONSTITUTION	82
OF THE MEANS OF PREVENTING THE GENERATION OF MALARIA, AND OF COUNTERACTING ITS EFFECTS ON THE HUMAN BODY	95
OF THE CLIMATE AND USUAL COURSE OF THE SEASONS IN THE BRITISH POSSESSIONS IN THE EAST	101

	PAGE
OF THE CLIMATE OF THE PROVINCE OF BENGAL	102
ABSTRACT OF THE MEDICAL RETURNS OF THE PRESIDENCY DIVISION OF THE BENGAL EUROPEAN ARMY	111
ABSTRACT OF THE MEDICAL RETURNS OF THE BERHAMPORE DIVISION OF THE BENGAL EUROPEAN ARMY.....	113
OF THE CLIMATE AND SEASONS OF THE PROVINCE OF BAHAR.....	114
ABSTRACT OF THE MEDICAL RETURNS OF THE DINAPORE DIVISION OF THE BENGAL EUROPEAN ARMY	116
OF THE CLIMATE, &c. OF THE PROVINCE OF ALLAHABAD	117
ABSTRACT OF THE MEDICAL RETURNS OF THE BENARES DIVISION OF THE BENGAL EUROPEAN ARMY	120
ABSTRACT OF THE MEDICAL RETURNS OF THE CAWNPOOR DIVISION OF THE BENGAL EUROPEAN ARMY	122
OF THE CLIMATE, &c. OF OUDE, AGRA, AND DELHI	123
ABSTRACT OF THE MEDICAL RETURNS OF THE MEERUT DIVISION OF THE BENGAL EUROPEAN ARMY	126
OF THE CLIMATE OF MALWA AND CENTRAL INDIA	127
ABSTRACT OF THE MEDICAL RETURNS OF THE MALWA DIVISION OF THE BENGAL EUROPEAN ARMY	129
OF THE CLIMATE OF GUNDWANA, &c.	130
ABSTRACT OF THE MEDICAL RETURNS OF THE NAGPOOR DIVISION OF THE BENGAL EUROPEAN ARMY	133
OF THE CLIMATE OF ORISSA	134
OF THE CLIMATE AND SEASONS OF MADRAS	135
OF THE CLIMATE, &c. OF THE CARNATIC, &c.....	139
OF THE CLIMATE AND SEASONS OF TRAVANCORE, OF MALABAR, AND CANARA, &c.	142
OF THE CLIMATE, &c. OF THE PROVINCE OF MYSORE, &c.....	145
OF THE CLIMATE, SITUATION, &c. OF SERINGAPATAM.....	146
OF THE CLIMATE, &c. OF THE CEDED DISTRICTS..	153
OF THE CLIMATE, &c. OF THE NORTHERN CIRCARS	155
OF THE CLIMATE, &c. OF THE PROVINCE OF HYDERABAD, &c.	156
RETURN OF THE PREVAILING DISEASES IN THE VARIOUS DIVISIONS OF THE MADRAS ARMY FOR 1821.....	160
OF THE CLIMATE AND SEASONS OF BOMBAY	161
OF THE CLIMATE AND SEASONS OF THE ISLAND OF CEYLON....	164
OF THE CLIMATE AND SEASONS OF CHITTAGONG, ARRAKAN, AND RANGOON.....	170
OF THE CLIMATE AND SEASONS OF JAVA AND ISLE OF FRANCE	175

CONTENTS.

xix

PAGE

OF THE CLIMATE, SEASONS, AND SALUBRITY OF THE CAPE OF GOOD HOPE AND WEST COAST OF AFRICA	183
OF THE CLIMATE, SEASONS, AND SALUBRITY OF THE WEST INDIES, OF DEMERARA, ESQUEBO, BERBICE, TRINIDAD, TOBAGO, ST. LUCIA, BARBADOES, AND JAMAICA	186
OF THE CLIMATE, SEASONS, AND SALUBRITY OF GIBRALTAR, MALTA, AND THE IONIAN ISLANDS	190
OF THE DIET AND REGIMEN ADOPTED BY EUROPEANS IN INDIA AND WARM CLIMATES, AS CAUSES OF DISEASE	192

CHAPTER III.

<i>ON THE PREMONITORY SYMPTOMS OF INTERTROPICAL DISEASES, AND ON THE IMPORT- ANCE OF ATTENDING TO THEM</i>	209
--	-----

BOOK II.

ON THOSE DISEASES OF THE STOMACH MOST PREVALENT IN INDIA AND WARM CLIMATES	225
---	-----

CHAPTER I.

<i>OF THE FUNCTIONAL OR PRIMARY DISORDERS OF THE STOMACH</i>	227
--	-----

SECTION I.

OF THE CAUSES, SYMPTOMS, AND NATURE OF INDIGESTION WITHIN THE TROPICS	228
---	-----

SECTION II.

OF THE TREATMENT AND REGIMEN OF DERANGEMENT OF THE STOMACH	241
--	-----

CHAPTER II.

<i>OF INFLAMMATIONS AND ORGANIC LESIONS OF THE STOMACH, WITH REMARKS ON THE USUAL APPEARANCES ON DISSECTION, AND MEANS OF CURE</i>	249
--	-----

SECTION I.

OF THE SYMPTOMS AND CAUSES OF INFLAMMATIONS OF THE STOMACH.—CASES	250
---	-----

SECTION II.

OF THE TREATMENT OF INFLAMMATIONS OF THE STOMACH.—CASES	269
---	-----

SECTION III.

REMARKS ON THE ORGANIC DISORDERS OF THE STOMACH OCCASIONALLY MET WITH IN INDIA	281
--	-----

SECTION IV.

TREATMENT OF THE FOREGONIG DISEASES.—CASES	285
--	-----

SECTION V.

PRECAUTIONS AS RESPECTS DIET AND REGIMEN IN THE FOREGOING DISEASES	288
--	-----

BOOK III.

ON THE DISEASES OF THE LIVER AND THE BILIARY APPARATUS.. ..	293
---	-----

CHAPTER I.

<i>OF FUNCTIONAL DISORDERS OF THE BILIARY ORGANS</i>	296
--	-----

SECTION I.

OF INCREASED SECRETION OF BILE.—CASES.	297
---	-----

SECTION II.

OF THE TREATMENT OF INCREASED SECRETION OF BILE.—CASES.	323
--	-----

SECTION III.

OF CONGESTION, OR ACCUMULATION OF BILE IN THE GALL-BLADDER OR DUCTS.—CASES	326
--	-----

SECTION IV.

OF CONGESTION OF BLOOD IN THE LIVER.—CASES.	340
--	-----

SECTION V.

OF TORPOR OF THE BILIARY ORGANS.—CASES.	366
--	-----

SECTION VI.

OF THE TREATMENT OF THE FOREGOING DERANGEMENTS OF THE LIVER.—CASES.	382
--	-----

CONTENTS.

xxi

PAGE

CHAPTER II.

OF INFLAMMATIONS OF THE LIVER, AND THEIR MORE FREQUENT TERMINATIONS IN WARM CLIMATES	402
---	-----

SECTION I.

OF THE NATURE, SYMPTOMS, AND CAUSES OF INFLAMMATIONS OF THE LIVER.—CASES.....	404
---	-----

SECTION II.

OF THE MORE CHRONIC INFLAMMATIONS OF THE LIVER, AND OF ORGANIC DISEASES OF THE ORGAN.—CASES.....	469
---	-----

SECTION III.

OF THE SYMPTOMS AND NATURE OF ABSCESS OF THE LIVER.—CASES	516
---	-----

SECTION IV.

OF THE TREATMENT OF INFLAMMATIONS OF THE LIVER.....	530
---	-----

SUB-SECTION I.

OF THE TREATMENT OF THE MORE ACTIVE FORMS OF HEPATITIS.....	532
BLOOD-LETTING, GENERAL AND LOCAL.....	ib.
MERCURIALS, PURGATIVES, AND LAXATIVES	592
OF OTHER MEANS OF CURE	598
OF THE TREATMENT OF THE COMPLICATIONS OF ACUTE HEPATITIS	600

SUB-SECTION II.

OF THE TREATMENT OF THE MORE CHRONIC FORMS OF INFLAMMATION OF THE BILIARY ORGANS	625
VASCULAR DEPLETIONS	626
NITRO-MURIATIC SOLUTION	627
NITROUS ACID.....	630
BLISTERS, SETONS, AND TEPID BATH	632
EMETICS.....	633
APERIENTS AND DEOBSTRUENTS	634
TONICS	635

SUB-SECTION III.

OF THE TREATMENT OF ABSCESS OF THE LIVER	645
OF THE EXTERNAL POINTING, AND OPERATION OF ABSCESS OF THE LIVER	652

SECTION IV.

CURSORY REMARKS ON HYDATIDS OF THE LIVER	677
--	-----

SECTION V.

PRECAUTIONS ON CHANGE OF CLIMATE, FOR THE ADOPTION OF THOSE SUBJECT TO DISEASES OF THE BILIARY ORGANS.....	683
---	-----

APPENDIX, NO. I.

MEDICAL RETURNS OF THE BENGAL PRESIDENCY DIVISION	ii
————— BERHAMPORE DIVISION.....	iii
————— DINAPORE DIVISION.....	iv
————— BENARES DIVISION	v
————— CAWNPORE DIVISION.....	vi
————— MEERUT DIVISION.....	vii
————— MALWA DIVISION	viii
————— NAGPORE DIVISION	ix

APPENDIX, NO. II.

MEDICAL AND PHYSICAL TOPOGRAPHY OF THE NILGHERRY MOUNTAINS.....	xi
OBSERVATIONS ON THE MYSORE AND CANARA DISTRICTS	xxii
————— MEDICAL TOPOGRAPHY OF THE DISTRICTS UNDER THE BOMBAY PRESIDENCY	xxiv

APPENDIX, NO. III.

MEDICAL RETURNS OF DEMERARA AND BERBICE.....	xxx
————— TRINIDAD	xxxi
————— TOBAGO	xxxii
————— BARBADOES.....	xxxiii
————— ST. LUCIA	xxxiv
————— JAMAICA	xxxv
APPENDIX TO THE CASES	xxxvi

PRACTICAL RESEARCHES
INTO THE
DISEASES OF WARM CLIMATES.

BOOK I.

PRELIMINARY OBSERVATIONS.

THE diseases most prevalent in warm climates have been treated of by authors whose opportunities of observation have been various, with regard to the particular sources of their experience, the circumstances peculiar to the patients who came before them, and the length of their practice. Of all these authors, there are few who have not contributed materially to our knowledge of the nature and treatment of these diseases. Some, however, have written more confidently than the nature of their experience and their subjects admitted of, conceiving that what had occurred to their own observation ought to have been noticed by others, and the results which they obtained should equally have been remarked by those who went before, and be confirmed by such as may come after them. But whilst some of those writers and essayists conceived that they were instructing the rising profession from the purest sources of information, their inexperienced readers seldom stopped to inquire into the extent of that information, or the peculiar circumstances under which it was obtained; they seldom considered, that

although disease has certain characters to-day, it may have very different characters on some other occasion, according as the nature of its causes may vary, and as the circumstances more immediately related with the patient may change.

Practitioners whose experience of the diseases of warm climates has been limited to those who, like themselves, have recently arrived from a cold country, possessed of a phlogistic diathesis and plethoric habit of body, heightened by living on salted animal food and a liberal use of spirits, perceiving vascular action increased, and even tumultuous, most properly deplete their patients, and find their practice successful. Elated with success, and without considering that the character of the disease and the issue of the practice are the result of the particular circumstances of the patients, they become prone to contend that the fevers and diseases of the country are of the same nature with those which they have observed in the narrow sphere of their experience, and are to be cured by the same means which they have practised.

Other practitioners have observed the diseases of intertropical countries under other or almost opposite circumstances, and owing to those circumstances, in connexion with an essential difference in the nature of the causes productive of these diseases, have been led to employ a method of cure very different from that now alluded to. They write on the diseases of warm climates, and, as they conceive, from experience. As an account merely of what they had themselves seen in the particular field in which they were labourers, their observations would have been valuable; but when they generalise from the very limited data they have obtained, and assert that what was true as respects what came before themselves, under particular influences and circumstances, must be true also of all that has been observed, or will be observed in future, — they may influence the inexperienced and insufficiently informed, but they will never command the assent of the practitioner, who, taking nature as his guide, follows the dictates of his own judgment, and endeavours to found his views of diseased actions, whether observed between the tropics or in the temperate zones, upon the

nature of the causes, the vicissitudes of season, climate, endemic and epidemic influences, and still more particularly upon the circumstances which are proper to the individual.

Amongst the various works which have already appeared upon the subjects now before us, there are very few which have proceeded from authors whose experience in warm climates has been diversified to that extent which could have been desired. They who have seen the diseases of those climates, only as they appear amongst ships of war or merchant ships, either at Diamond Harbour, or Batavia, or Vera Cruz, or Kingston, during a few weeks' or months' stay at these ports, may be very able and safe guides as respects the diseases which occur in ships recently arrived or stationed at these places, at particular seasons of the year; but they can never be considered authorities as to the nature and treatment of the diseases of the country, as they occur under every variety of cause, influence, and circumstance by which they are modified. Nor can they be always implicitly trusted as regards the maladies of the class of individuals amongst whom their practice has been limited; for much will depend, as to both the nature and treatment of the diseases, upon the length of time ships have been navigating within the tropics, the country from which the crew has been obtained, the time which has elapsed since they left a cold country, the manner in which they have been fed, the quantity of spirits they have been allowed, whether or no they have been before in a warm climate, whether their stay in it was long or short, or at a remote or recent period, and whether the susceptibility of their frames and the rigidity of their fibres have been subdued by previous attacks of what is usually called seasoning fevers.

Nor can, on the other hand, army physicians or surgeons, whose observations have been limited to a particular country, district, or situation, and to a class of men very distinct in their habits and occupations from the community generally, be received as competent authorities upon a subject which has reference to all classes of men,—to natives as well as Europeans,—and to those amongst the latter who have passed the greater part of their lives in a warm country, equally with those who have recently

9

arrived in it. When, however, their opportunities are extensive and diversified, there is no class of practitioners who have more ample means of advancing our knowledge of diseases: they have complete control over their patients; and new remedies and improved modes of treatment may be employed, and *post mortem* examinations may always be made by them without restriction.

Unfortunately for the state of medical science, as regards intertropical diseases, written opinions respecting them have been too often furnished by those to whom many of the above observations very closely apply. And still more unfortunately for the young and inexperienced practitioner, upon his arrival in warm climates, instead of endeavouring closely to analyse the symptoms of the disorders which come before him, and to judge impartially respecting them, assisted by the lights which science has afforded him, his mind is biassed by the opinions promulgated by those whose sources of experience are of the description already noticed, and he surrenders his judgment to their direction. The unreservedness with which their pathological descriptions and curative precepts are delivered, inspire him with confidence as to the universality of their application, and he adopts the treatment inculcated, until the results open his eyes, and he at last perceives that numerous circumstances modify the character of intertropical diseases, as well as of those of temperate climes; and that the treatment, in order to become eminently successful, must be always suited to the exact aspect which these diseases assume, as far as that can be determined, aided by enlightened views of the operations and laws of the animal economy in health and in disease.

There have appeared, however, some authors on intertropical diseases, to whom the foregoing remarks are not intended to apply, whose experience has been sufficiently extensive to convince them of the difficulty of the subjects on which they have honestly endeavoured to instruct the profession, and at the same time to render them less confident as to matters, the relations of which have not been before them in that full and satisfactory manner which is requisite to the formation of sound opinions respecting them. Such writers are the landmarks of our profession, forming the best guides by which

the inexperienced navigator through the dangerous channels of our science, can secure the safety of those committed to his care, and promote his own reputation. To those writers we shall have frequent occasion to recur, and with that pleasure which the recollection of the advantages derived from them always inspires.

It would have been desirable,—for no doubt can be entertained of its great utility, both to science and to humanity,—that, in the place of the numerous and contradictory opinions upon intertropical diseases which have issued from the press during the last half century, and bewildered the inexperienced reader, and which have been advanced chiefly by those whose field of observation and length of practice have been extremely limited,—the results of extensive and diversified experience of disease, amongst long residents as well as recent comers into warm climates, had been furnished the profession; that the disorders appearing amongst Europeans, under every variety of circumstance and exposure in which they have been placed, had been faithfully reviewed, and considered in relation to the nature of the causes and the condition of the individuals on which these causes operated; and that the disorders occurring under similar circumstances, and from the influence of the same kind of causes, amongst the native inhabitants, had also received that degree of attention which the subject, as to both its inherent importance and the interest it is calculated to afford, when compared with that of European sickness, so unquestionably deserves.

It is, however, to be much regretted, that those who have enjoyed extensive opportunities of observing the diseases most prevalent in warm climates, as regards both the length of their experience and its diversity among all classes of Europeans, civil, military, and naval, as well as among the native inhabitants,—who have seen those diseases under every vicissitude of season, and of public and civil service, in a great variety of countries and circumstances,—have, nevertheless, either allowed the results of their experience to perish with themselves, or continued to withhold information which could not fail of proving serviceable to their inexperienced brethren. It is chiefly with a desire of setting an example to those who, with himself, have enjoyed such oppor-

tunities, to break the silence which they have so long kept, and to endeavour to furnish a part of what they have themselves acquired to those who may in any way stand in need of it, that the author now appears before the public. He will obtain his object, if he shall find that the attempt which he has imperfectly made be followed more successfully by others, abler than himself to do the subject its deserved justice,—if others, who have seen and observed for a long series of years the derangements produced upon the human constitution, of Europeans particularly, in warm climates, shall hereafter furnish to their inexperienced successors in the same field of exertion the fruits of their matured judgment and observation, and thus fill up the sketch which he has imperfectly attempted to draw. And, above all, he will be gratified, if what he is about to communicate shall lead the well-educated medical practitioner, proceeding to intertropical regions, to observe and to think; and to act rather from the rational deductions which he may form from a careful and comprehensive view of the circumstances producing and influencing the career of disease, than be guided by the confident and unreserved dicta of the imperfectly informed writer, whose advices are suitable only to particular circumstances, which circumstances may turn up but occasionally, or even rarely, in the general revolution of human events. The practitioner who shall thus endeavour, upon his arrival in a warm climate, to observe and to reason upon the derangements taking place in the human frame, will soon become the most decided and the most successful controller of their course,—will know when and how he should attempt to arrest them, and, when this idea cannot be entertained, will conduct them with the greatest safety to a successful issue, when it is in the power of art to accomplish this desired object. He will, moreover, observe that the diseases which have been described and held up to him, with regard both to their nature and treatment, as forming of themselves a distinct class, proper to intertropical climates, frequently occur in other countries, and, like other disorders, are merely functional at their commencement, but quickly running their course, and generally assuming a more acute aspect, owing to the concentrated nature of their causes, the high temperature of the atmosphere, and the resulting influence of both, and of the diet and regimen adopted, upon the constitution.

The diseases of warm climates are also those of temperate countries during very hot seasons, more particularly in situations the nature of which approaches to that generally observable within the tropics; they are, in short, the prevalent diseases of other climates rendered more intense by more powerful causes, and these more continued in their action, and much more prolonged, and hence their effects become more marked than elsewhere. From this it is apparent, that the practitioner in temperate regions, if he wish to extend his knowledge of disease generally, or if he even be desirous of becoming acquainted with the forms which disorders assume at particular seasons, which are occasionally coming around, should not overlook the study of those derangements because they are more frequently met with within the tropics, and because they have received the too limited appellation of inter-tropical diseases. That these derangements of the human frame are more frequently met with in warm climates, and less so in temperate countries, is merely the result of the general order of nature as regards the animal economy, and the human economy more particularly.

The finer shades of conformation and constitution, it should be farther remarked, are such as to adapt man to the circumstances and vicissitudes of the country in which Providence has ordained him to exist. This conformation is chiefly the result of the influences which have continued to operate on the parents; and the effect at last becomes conformable with the general character of the causes producing it. The European is constituted in a manner the best suited to the climate which he inhabits; and a similar conformation of the system of man to the circumstances of the country, may be traced in every part of the globe. When, however, man migrates from the climate which contributed to generate the peculiarities of his frame, to one which is remarkably different from that to which he is assimilated, then disorders of various kinds and grades may be expected. Those organs which changes and peculiarities of climate chiefly affect, soon become deranged in their functions; and when they continue disordered for any time, additional disease is generated in many of the other organs of the frame, especially in those which are more intimately allied in function to them. What is here inferred, *à priori*, is evident in practice,

particularly upon an intimate view of the succession of the phenomena of disease. But the climate, and the circumstances more intimately connected with the climate and the soil, or vicissitudes of temperature and of season, are not to be considered as the sole causes of disorder, for diseased actions proceed not always from these; and when they do apparently derive their origin from thence, other causes frequently co-operate with them in producing the effect. The modes of living, the diet and regimen of the individual, whose frame and constitution are unassimilated to the country, are generally as fertile causes of disease as those which relate to the climate, inasmuch as they are but ill-adapted to the nature of the change which he has experienced, and to the peculiarities of his system, under the circumstances in which he has been recently placed; and these latter combine with the former class of causes in producing diseases which, but for this combination, might have never been occasioned. The individual who is, as it were, transplanted from the air and soil from which he has been, in a measure, formed, and in which he has longer vegetated, into those with respect to which he is quite an exotic,—instead of adopting the diet and regimen suited to the new circumstances into which he is placed, more generally pursues both the one and the other, according as the custom of those around him, or his own morbid appetites, seduce him. Although continually operated upon by causes, of whose influence his system is the more susceptible, the more recently he has undergone the change; although even the air which he breathes tends, at the same time that it animates, to modify his constitution to the new circumstances in which it is placed, and to generate disease in the process of transformation which is being affected; yet he more generally lives on as if he were entirely independent both of it and of the substances which he receives into his stomach; and, instead of adapting, in some degree, his diet and regimen to the climate in which he is placed, he is seduced by the sensations of his palate and his pleasures, which, when indulged in, occasion that condition of the system which, if not amounting to actual disease, is generally productive of it, under the most favourable circumstances of climate; and more especially during warm states of the atmosphere, and when it is loaded by moisture, terrestrial effluvia, and other causes of disorder,

We have considered it requisite to the clearer elucidation of the subjects which follow, especially the pathological and practical parts of them, to premise some observations upon the healthy functions of those organs whose diseases we are about to treat of, more particularly upon those functions which the climate and circumstances of intertropical regions chiefly disorder: and in order to enable the young practitioner, as well as the scientific reader, more fully to comprehend the views which will be developed in the sequel, we shall divide these preliminary observations into three chapters. The first will embrace some remarks on the functions of the digestive and assimilating organs, and on the modifications which they may experience, as productive of various diseases. The second will be devoted to the general consideration of the chief causes of disease in warm climates, and particularly in India. In the third chapter will be discussed the importance of paying an early attention to disease, or rather to the commencement of disease, as evinced by its premonitory symptoms.

CHAPTER I.

REMARKS RESPECTING SOME OF THE DIGESTIVE AND ASSIMILATING FUNCTIONS.

THE importance of a correct understanding of the nature of many of the above functions, to the investigation of the majority of diseases, is too apparent to require proof. Yet, notwithstanding the value of this preliminary inquiry, more particularly in its relation to the causes and treatment of diseases generally, it has been seldom entered upon in connexion with practical disquisitions; and observations respecting it have more generally been characterised as hypothetical, than viewed as attempts at placing our reasoning respecting the nature and treatment of diseases, particularly those which relate to the digestive and assimilating organs, on a sure basis.

In the following sections of this chapter it is not intended to give a full description of the functions of digestion and assimilation, but merely to remark respecting those parts of the operations which more closely relate to the subjects we are about to investigate, the preliminary consideration of which is important in a two-fold manner, both as furnishing a key to the causes, and to the early changes, productive of serious diseases in the majority of instances; and as shewing the importance of an intimate attention to these functions, in our endeavours to detect the early stages of disorder, as well as to comprehend its nature, and to direct our treatment throughout its progress with precision and with a felicitous effect.

SECTION I.

*Cursory Remarks on the Processes of Mastication and Digestion in the Stomach ;
or the Function of Chymification.*

BEFORE entering upon the subject of digestion, it may be proper to premise a few remarks respecting the sensations which lead us to receive aliment and fluids into the stomach. Appetite and thirst are two instinctive sensations which are common to all animals possessed of a nervous system; and are intended not only as the incentives to repair the waste experienced by the system, but also, by their presence or defect, as guides to the period when the materials calculated to repair such waste may be resorted to with propriety. Physiologists have been much at a loss to account for these sensations, and have endeavoured to explain them variously. Without referring to any of the hypotheses they have advanced on the subject, it may be as well to state, that nothing is further ascertained respecting them, as regards their nature, than that hunger seems to proceed from a change in the sensibility of the nerves supplying the digestive organs; and that thirst depends upon some condition of the nerves supplying the same organs, more particularly those of the fauces and pharynx, and that it is generally related to a deficiency of the secretions poured out in these situations, and to an excited state of the mucous surface of the stomach and œsophagus.

A subject of much greater importance to the intertropical practitioner, and indeed to all practitioners, are the pathological states of the system when those appetites are either deficient or in excess. As respects hunger, it may be generally affirmed, that when it returns after a lapse of a few hours from the period of partaking of a moderate meal, and is not accompanied with any unusual sensation, it may be considered, in conjunction with other signs, as indicative of health. But this is by no means uniformly the case. In some affections of the stomach, liver, and bowels, the appetite may be unimpaired,

or even ravenous; and in such cases, the indulgence of it tends to prolong disease, and to hasten organic lesion. Indeed, in many of the most severe disorders which we have to consider, inordinate appetite, when met with, ought to be viewed as a matter of serious import, and should put us on our guard as to the consequence both of such a condition of the system which it indicates and of indulging it. Increase of appetite is often observed in the advanced stages of several of the disorders of the digestive and assimilating organs, and is then generally attended with, and even a symptom of, great debility. In those states of the system the appetite may be craving, even when the stomach is full. This circumstance alone shews that hunger is not to be explained by supposing that it arises either from the action of the gastric juice upon the coats of the stomach, or from emptiness of the organ itself. In many of the slighter disorders of the digestive organs, the appetite is also great. This is often the case when the derangement consists in, or is accompanied by, active or increased circulation through the liver, and an excited state of the mucous coat of the stomach and small intestines. These conditions of the stomach and liver are frequent amongst Europeans in India and warm climates, and are generally kept up by a heating and stimulating form of diet and cookery, which not only increases these conditions of the digestive and assimilating organs, but also leads to the indulgence in a much fuller meal than the wants of the system require. Hence the states of slight disorder which an inordinate appetite evinces are increased and hastened into irremediable disease by indulging it, and by adding the spur of hot spices, warm sauces, and curries, with heating wines, to this indulgence, when a strict rein should be imposed, and uniformly observed, until the functions of the stomach attain their due regularity, and every morbid sensation vanishes.

Thirst is a sensation which at all times may be gratified, provided the fluid taken be suited to the circumstances and state of the individual at the time, both as respects its quantity and kind. The fluids which are generally most beneficial both in their influence upon the digestive organs and system generally, and in allaying this very urgent feeling, are those which combine a gently astringent to a cooling effect. Amongst those may be particularised small

quantities of the mineral or vegetable acids in pure water, the supertartrate of potash, or even a small proportion of the carbonates of the alkalies. These may be used advantageously, both medicinally and dietetically, and may be changed occasionally as circumstances may require. Thirst is not readily quenched in warm climates by cold fluids: for the chilling impression made by them upon the internal organs is soon after followed by vascular reaction, even when a worse consequence does not supervene; and the effect thus produced increases still farther the demands for them.* Fluids, and more particularly those to which cooling ingredients have been added, ought never to be taken when very cold: they will be found much more quenching and beneficial, as regards the system generally, when their temperature approaches very nearly to that of the body. Too low a temperature of the ingested fluids is hurtful, and even dangerous, in weak states of the system, and when the body is covered by perspiration. Vinous or spirituous liquors, whether alone or much diluted with water, are still more inefficient than cold fluids as mere quenchers of thirst. There is, perhaps, only one circumstance which can palliate the impropriety of the use of spirituous liquor,—and that is, when pure water cannot possibly be obtained. Between the processes of filtering and boiling this fluid, its deleterious influence may be in a great measure destroyed; but neither the one nor the other, nor even both conjoined, will entirely do away with the septic tendency which it possesses in some situations and under

* We have frequently found that washing the mouth, and gargling the throat and fauces, have relieved thirst better than large draughts of water or other fluids; and have always made it a point that soldiers, who, when marching on dusty roads, and in hot weather, are much distressed by thirst, should be instructed in this mode of allaying it. Recruits and young soldiers are very apt to take large draughts of water when they come to a stream or tank, and are often injured by the practice; but, as soon as they have become acquainted with the means here noticed, they have readily preferred it. A little alum may be added to the water thus used in gargling with advantage, or a small quantity of nitre, or of any acid. We have mentioned this plan here, as it is of great importance to the soldier on service between the tropics, or in any country during warm seasons; and he readily adopts it, and prefers it. Under the circumstances of active service, in warm seasons or countries, large draughts of any fluid frequently increase, and but seldom diminish thirst; and should never be indulged in farther than circumstances absolutely require.

some circumstances, which will fall under consideration in their proper places. In this case, the addition of a small quantity of spirits has been found serviceable in counteracting the bad effects of this impure fluid, and then alone should spirits be resorted to. The same objections which may be urged against the use of spirits are equally applicable to the Madeira and Port wines which come to warm countries; for they contain so much brandy, that their heating effects, even when much diluted, are always more or less felt, at a longer or shorter period from the time at which they were resorted to. Having premised these remarks upon the sensations more particularly related to the functions of the organs the pathology of which we are about to consider, we next proceed to view some circumstances connected with these functions themselves.

The digestive functions may be divided into two separate processes — namely, the process of chymification, and that of chylification. The former is performed in the mouth and the stomach, the latter in the intestines. That particular part of the operation which is performed by means of the jaws on the food whilst it remains in the mouth, is of much greater importance than is generally supposed, particularly to those whose digestive organs are weak, or who lead sedentary lives, and are debarred from regular exercise in the open air. The thinking practitioner has only to view the masticating apparatus throughout the different classes of animals, to become fully convinced of the importance of the preparatory process of mastication; and, after taking this view, he will perceive that this process is not to be considered only as one which has the more or less minute division of the food for its object, but should be contemplated as the first stage of digestion itself, during which the food ought to become fully imbued with the salivary fluids; for unless it be thus imbued, it is not sufficiently prepared for the ulterior parts of the process which it has to undergo.

Notwithstanding the importance of a perfect mastication of the food taken into the stomach, this operation is insufficiently performed on many occasions. 1st. It may be imperfect as respects the minute division of the food; and this

is very generally the case with those who eat fast, and with those who have few or bad teeth. 2dly. Mastication is also imperfect when the food is not thoroughly imbued with the salivary fluids and the mucus covering the surfaces of the mouth. It must be apparent, that the process of insalivation cannot take place to the full extent during quick eating. The frequent action of the jaws is as necessary to the copious secretion of the salivary fluids as the presence of the sapid body is requisite to the excitation of the nerves which supply the glands secreting these fluids. During mastication, also, atmospheric air mixes with the food; and the saliva, owing to its albuminous nature, absorbs a considerable portion of its oxygen; and the well-masticated bolus, thus fully penetrated by the salivary and mucous juices, and containing some atmospheric air, and an increased proportion of oxygen, is in a state of due preparation for the action of the stomach as soon as it arrives in this viscus. It must be evident, from what has been here advanced, that certain modes of cookery and particular kinds of food may prove difficult of digestion, owing, in some measure, to their being generally taken into the stomach in a condition not requiring, for the operation of deglutition, a complete admixture with the salivary secretions. This is a matter which requires more attention, as respects various diseases of the digestive organs, than has yet been paid to it, and which, in addition to various others with which it is connected but too frequently, will come more fully under consideration hereafter.

But besides the foregoing requisites to a perfect mastication of the food, there is one circumstance which may be viewed briefly in relation to this process. The circumstance in question is that of eating only with an appetite, and particularly for that which is the article of diet. The sympathy existing between the state of the stomach and of the salivary apparatus has long been a subject of observation, and even of experiment. And the well-known fact of the copious flow of the saliva into the mouth, when the appetite is keen, or when particular articles of food are wished for, is of itself a proof of the importance of this secretion to the function which follows that of mastication, and of which mastication is an important part. Appetite, then, particularly for the food which is to be taken, is necessary

to its satisfactory impregnation with the saliva, inasmuch as the saliva is secreted more copiously upon the mastication of what is relished.*

The propriety of paying due attention to the proper mastication of the food, as well as to its selection, and the time of resorting to it, although apparent both in theory and practice, is not always considered in the manner which the subject deserves, by those labouring under chronic disorders of the digestive organs; nor is it always sufficiently inculcated by the medical attendant.

During mastication, it may be further remarked, the aliments have their temperature in some degree assimilated to that of the stomach. When, however, the substances about to be received into this organ is either much colder or warmer than the system, the process of mastication, and the time they remain in the mouth, serve to equalise their temperature. In cases of fluids, or of semi-fluid food, which undergo little or no mastication, these circumstances have no place; and when swallowed hastily, without any change being previously effected in them, the functions of the stomach

* The secretion of the saliva seems to be under the influence of the same mental emotions as affect the functions of the stomach. Fear, anxiety, and various other depressing passions, diminish digestion; and most probably produce this effect by diminishing the secretion of the gastric juice. Observation shows us that they have a decided influence in lessening, or even in entirely arresting, the secretion of saliva; a circumstance not unknown to the more observant nations of the East. In illustration of this, it may be mentioned, that the conjurers in India often found upon this circumstance, a method of detecting theft amongst servants. When a robbery has been committed in a family, a conjurer is sent for, and great preparations are made. A few days are allowed to elapse before he commences his operations, for the purpose of allowing time for the restitution of the stolen property. If, however, it be not restored by the time fixed, he proceeds with his operations; one of which is as follows:—He causes a quantity of boiled rice to be produced, of which all those suspected must eat; and, after masticating it for some time, he desires them all to spit it upon separate leaves, or any thing else equally convenient for the purpose of inspection and comparison. He now examines this masticated rice very knowingly, and immediately points out the culprit, from observing that the rice which he has been masticating is perfectly dry, while that which was masticated by the others is moistened by the saliva.

may be much impaired by the temperature being much above or below that of itself, and not suited to the states of the system at the time.

The food having undergone in the mouth the preparatory process for digestion in the stomach, is next conveyed into this organ, by means of the actions of the pharynx and œsophagus, where it is digested or converted into chyme. The operation of digestion is chiefly a vital function, and one which cannot be explained according to chemical or mechanical laws, although both chemical and mechanical changes may have some subordinate influence in the process. It has been likened to fermentation, and imputed to chemical changes effected by means of the juices poured into the stomach from its internal surface: but this is merely gratuitous, and has been chiefly supported by certain chemical physiologists, who observe natural phenomena only according to chemical laws.

The stomach, in man, should be viewed both as a muscular and as a secreting organ. The secretions which are poured into it from its mucous surface consist of the gastric juice and mucus; the former being thrown out from the extreme capillaries of the mucous tissue, the latter being secreted by the follicles of this coat. Whilst the gastric juice is more immediately active in performing the digestive process, the mucus protects the villous surface from such injurious effects as the ingesta on many occasions are calculated to produce. The muscular actions of the stomach are necessary to its functions; and it is owing to its muscular conformation that it adapts itself to its contents, and conveys the digested materials towards the pyloric opening, and through it into the duodenum or commencement of the small intestines. The muscular actions of the stomach, and the conditions of its secretions, are entirely dependent upon the vital energy of the organ, which is itself dependent upon the state of vitality of the system generally.

The food being reduced to a proper state of comminution, and admixture with the salivary juices and mucus of the mouth and palate, and conveyed into the stomach, is penetrated by the gastric fluid exhaled from the villous coat of this viscus. The portion thus operated upon, and thereby converted

into chyme, is propelled by the contractions of the muscular fibres towards the pylorus through which it passes, whilst successive strata of aliment are similarly acted upon by the gastric fluids, and disposed of by means of the tonic contractile function of the muscular coat, until the whole of the aliment is reduced to chyme, and carried into the duodenum.

The tonic contractile action of the muscular fibres of the stomach, and the due secretion of gastric fluid and mucus—the agents of the process—are dependent upon the state of the organ for their perfection; for organic contractility is perfect, according as the vital energy is complete; and secretion is equally dependent upon the same cause. Hence, whatever may be the *modus operandi* of the gastric juice upon the food with which it mingles, digestion in the stomach is owing to the vitality of the viscus, which is itself dependent upon that of the whole system. When, therefore, this organ is weakened, either primarily or through the medium of the general frame, it evidently results that its contractile and secreting functions must be impaired. Derangements of the digestive operation will then be apparent, and become aggravated, whenever the food is in any way unsuited to the particular states of the stomach at the time.

There are few causes more productive of disorders of the stomach, in warm, or even in cold climates, than quick eating, imperfect mastication, and over-distention of the stomach. These three causes are very generally conjoined; but, whether acting singly or combined, they have always a more or less decided influence in deranging the digestive process, especially in those who are debilitated by the influence of a climate to which they are unassimilated, or by disease. When the food is taken quickly into the stomach, and in an imperfectly masticated condition, it cannot have undergone the requisite degree of comminution, and admixture with the salivary juices and mucus of the mouth, and is hence not sufficiently prepared for the action of the gastric fluid. When food, also, is received into the stomach in this manner, distention of the viscus is thereby too quickly produced, and particularly if it be taken in too large quantity. On almost every occasion of quick eating and imperfect mastication a much too large quantity is swallowed.

This chiefly arises from the circumstance of the appetite still continuing for some time after a sufficient quantity of food is taken : for hunger is a sensation which is not instantly appeased, however large may be the quantity of aliment received at once into the stomach.

Physiologists have feigned a number of hypotheses, in order to explain hunger. The frequently ascertained fact, that it may be present even whilst the stomach is replete with food, as well as various other circumstances, serve to shew that it is merely a sensation proper to this viscus, dependent upon a certain state of its nervous system, and, in health, generally related to an empty condition, or to deficient stimulus of its nerves. Now, when food is swallowed too hastily, the portions of it first taken have not had sufficient time to act upon and to assuage the sensibility of the organ before too great a quantity is received, and the stomach thereby becomes distended in such a manner as to prove injurious to its tonic and contractile energies. The result of this is slow and painful digestion, and many of the evils which will come under consideration in the sequel.

During the mastication of solid aliment, the admixture with it of the juices usually poured into the mouth, and the subsequent action of the gastric solvent and mucus, serve to give the chyme its usual consistence. But these fluids are not quite sufficient for the digestion of solid food ; for as the process proceeds the central portions of the mass frequently yield their moisture to the concentric layer which is being acted upon by the gastric juice ; and hence the want of fluid, which is frequently felt as digestion goes forward.

In weak conditions of the stomach, solid food of a light description, and well-masticated, is always much easier of digestion than fluid or semi-fluid aliments. The former generally undergoes a proper degree of preparation in the mouth ; but the latter seldom requiring the masticatory process, receives but little, and most frequently not any, admixture of the salivary juices : and when the gastric solvent is either deficient in energy, or in too small a quantity for the purposes of healthy digestion, this species of food is generally

productive of acidity, flatulence, cardialgia, &c., owing to the circumstance of it diluting, and rendering still weaker the gastric juice, so that this fluid thereby becomes a very imperfect solvent of the portions of aliment taken into the stomach about the same time. Drinking too much, either before, during, or soon after a meal, has generally a similarly injurious effect upon the digestive process: for not only are the gastric secretions too much diluted thereby, but the stomach is also over-distended, and its tone impaired: and if it were not for the readiness with which fluids are absorbed from the stomach when in excess, the digestive process would often be entirely put a stop to, as it is generally impeded and greatly deranged by the habit.

The temperature of fluids about to be received into the stomach, either during or after a meal, is a matter of great importance, particularly to those residing in, or who have resided in, a warm climate, and whose digestive organs are weak and languid, or in any respect diseased. Cold fluids, particularly when taken in large quantity, make an injurious impression upon a weak stomach, which its powers of reaction are often incapable of overcoming; and, besides, they over-distend it and over-dilute its fluids, and favour congestions of the liver. Under circumstances promoting the super-vention of reaction after the ingestion of cold fluids, the system should be in a state of tolerable tone and health, and all the digestive organs unimpaired in their functions, in order to endure the frequent repetition of the practice with impunity: for if there exist congestion of the liver, or chronic inflammatory action of it, or of the mucous surface of the stomach itself, or even a tendency to any of those derangements, the use of very cold fluids, particularly under certain states of the system often occurring in warm climates, will prove hurtful, from the frequent reproduction of reaction in the diseased textures. On the other hand, fluids whose temperature is much above that of the blood is injurious in another way; and whilst they occasion an immediate excitement of the surfaces with which they come in contact, they relax the tone of the organ, and occasion indirect debility of its secreting functions. In the majority of individuals whose digestive organs are weakened by living in a warm climate, a temperature of the ingested fluids approaching nearly to that of the blood itself, and rather under than above this standard, will generally be found

the most beneficial, both as respects the wants of the stomach, and the functions of the liver. And unless we wish to make a particular use of the fluids to be received into the stomach in a curative point of view, they should never exceed the wants of the system, which are always expressed by thirst.

Before we leave this part of the subject, it may be proper to notice the results of the experiments which have been recently performed, in order to illustrate the nature of the digestive process in the stomach. Dr. W. Philip found, that, upon dividing in rabbits the eighth pair of nerves, or those which run from the brain to the stomach and diaphragm, the function of digestion, as respects the stomach, was arrested; and that when galvanism was applied to the trunk of the eighth pair, this function was restored. Dr. Philip concluded from this, that the eighth pair of nerves convey the nervous influence from the brain to the stomach; that this influence is productive of digestion; and that, when its operation is cut off, its place may be supplied, as regards the performance of the function, by galvanism. From this latter circumstance he has farther inferred, that galvanism and nervous influence are identical. Although Dr. Philip's experiments by no means admit of the inferences he has drawn from them, they seem to shew, that the eighth pair of nerves convey the influence of the brain to the stomach; which influence merely reinforces or stimulates the vital energy of this viscus.*

* This conclusion is farther supported by the experiments performed at Paris, by MM. Breschet, Edwards, and Vavaseur, in order to illustrate this subject. The inferences which these physiologists drew from their experiments seem more accordant with the results, and with what is observed throughout the animal kingdom and in man during the various states of disorder. According to them,

“ 1st. Simple section of the two pneumo-gastric or eighth pair of nerves in the region of the neck, without loss of substance, and without separating the cut extremities, does not prevent digestion from taking place, but merely retards it in an evident manner.

“ 2dly. Section of these nerves, with loss of their substance, diminishes considerably, and much more than simple section, the digestive action of the stomach, but it does not appear to abolish it completely.

“ 3dly. Section, or destruction of a part of the spinal marrow, or the removal of a portion of the brain, acts in the same manner on the changes which the food undergoes in the stomach.

“ 4thly. Narcotics, administered so as to produce coma, equally diminish the energy of the digestive powers.

SECTION II.

Of the Functions of the Liver, Pancreas, and Spleen.

BEFORE we can take a clear view of the several important parts of the functions of digestion in the small and large intestines, it will be necessary to offer some remarks respecting the offices which the liver, pancreas, and spleen, perform in the economy, and the uses which the fluids secreted by the

“ 5thly. It results, consequently, that every thing which diminishes the amount of nervous influence transmitted to the stomach weakens the digestive action.

“ 6thly, and finally. When digestion is almost completely suspended by the section, with loss of substance of the pneumo-gastric nerves, the digestive action of the stomach may be re-established, and the food contained therein be converted into chyle by means of the galvanic influence, with almost as much rapidity, and as perfectly, at least in appearance, as under ordinary circumstances*.”

The acute observations offered by Dr. Copland, in his Appendix to M. Richerand’s Physiology, upon Dr. Philips’s inferences, seem to be particularly appropriate.

“ When the connexions,” Dr. Copland observes, “ of the different orders of nerves which supply the stomach, and the intimate relation consequently subsisting between this organ and the centres to which these nerves respectively belong are considered, it cannot for a moment be doubted that the interruption of the channel through which this connection takes place should be followed by a deranged state of the functions depending thereupon. Allowing the stomach to derive its chief and its more vital influence from the ganglial system of nerves, and an additional and a modified influence from the cerebro-spinal system, the latter exciting or otherwise influencing the former, and granting that respiration is requisite to the energy of both, it surely cannot be for a moment doubted, that an interruption either of the one or the other should occasion, owing both to the defect of a requisite influence and to the injury done to the system generally by the experiment, a very considerable derangement of the functions of this organ. We perceive that much slighter causes will produce a much greater disorder of the actions of the stomach than the formidable operation of division of the eighth pair of nerves—formidable not only as respects its effects upon digestion, but as regards its influence on the function of respiration, and upon the body generally. Can it therefore be a matter of surprise, that destruction of, or interruption to, a wonted and requisite influence, should be followed

* Archives Générales de Médecine, Août, 1823.

liver and pancreas serve in the more advanced stages of the digestive and assimilating processes.

The *functions of the liver* have been usually limited to the secretion of the bile; and attention has been chiefly directed to the manner in which this fluid is formed, to its uses in the economy, and to the vessels concerned in its production. Although these topics are sufficiently important in themselves, yet it seems not altogether unnecessary to inquire whether or no the office of the liver be limited to the secretion of bile alone, or whether this viscus may not also perform some other function in the assimilating process. After taking a brief view of the part which it evidently and undeniably performs,

by marked effects upon the organ which such influence is destined to actuate? Because the influence conveyed by the nerves from the brain and spinal marrow affects the functions of the stomach, or because an interruption to it disorders them, can it therefore be logically concluded that this viscus derives its functions from this source, and that none of them acknowledges any other origin? Because these particular nerves are ready conductors of galvanism, and because galvanism excites the natural actions of the digestive organs, ought it therefore to be concluded that the natural office of these nerves is to convey and distribute this agent, or that the vital influence with which these organs are endowed is identically the same as it? We think that no one can be justified in answering these questions in the affirmative by the evidence which these experiments afford. From a careful consideration of the phenomena which they furnished, and from the few experiments which we have made with this active agent, we conclude,—1st. That the functions of the stomach depend chiefly upon the supply of ganglial nerves, which its vessels, muscular fibres, and secreting surface, receive. 2d. That the pneumo-gastric nerves convey the influence of the cerebro-spinal system to this organ, which influence reinforces that which it receives from the ganglial system, or proves a stimulus to it. 3d. That this latter influence is more requisite to the performance of the functions of the stomach, the older the animal is, and the higher we rise in our observations amongst the more perfect animals. 4th. That when this influence is interrupted, in a more or less complete manner, in its course to the stomach, its place may be in some measure supplied by galvanism, which seems to excite the proper or vital influence which the organ receives from the ganglial system. 5th. That we have no proof of galvanism acting otherwise in the process than as a stimulus to properties already possessed by the organ on which it acts, and that it acts in those experiments through a medium to which the organ is habituated, and in a great measure dependant for a natural excitant. 6th. That although galvanism excites the functions of the stomach for a time, we have no evidence of its continued power in promoting them during a protracted interruption of either the one species of nervous influence or the other: it even appears probable that the continued operation of this agent, although like other

we shall next inquire into the extent of office which it seems to us to fulfil.

The blood which flows into the vena portæ possesses, owing to its long and languid course through the mesenteric veins, &c. the venous characters, in the highest degree. These veins unite into one trunk, and form the portal vein, which now assumes the form of an artery, both as regards the thickness of its coats and the manner of its ramification, and conveys the blood which has returned from the organs of digestion to the granular or secreting structure of the liver. From the peculiar character of the circulation in the liver, and the kind of blood which the portal vein transmits to its granular structure, it has been inferred that the bile is there secreted from the blood sent to the liver by this vein. This opinion has been plausibly supported by the chemical theory, that venous blood abounds more with carbon and hydrogen than arterial blood; and that, as bile chiefly consists of carbon and hydrogen, the venous fluid only is suited to its production, it being formed more or less copiously according as these chemical principles more or less abound in the blood; or, in other words, according as the blood is possessed of more or less of the venous character. Notwithstanding the circumstances which seem thus to favour the opinion that the secretion of bile must necessarily take place from venous blood, and that the peculiar nature of the portal circulation is

powerful stimuli it at first actively excites the natural functions of the part on which it acts, would, nevertheless, exhaust them, and more especially if they were not supplied from their natural sources. 7th. That, as we have no comparative trials of the effects of other powerful stimuli under similar circumstances to those in which galvanism has been employed, conclusive inferences cannot be drawn respecting the extent of influence of that agent, at least none that can oppugn the above positions: they may, and very probably they will, confirm them, and shew that the activity of galvanism in exciting the animal operations, merely results from the properties of this agent enabling it to act through channels which convey a natural and a requisite influence, in a more energetic manner than other excitants which we can employ in our experiments. Reasoning, indeed, *à priori*, from the properties of galvanism, and from its operations upon inorganised matter, we would be led to expect more energetic effects from it upon the animal system than from any other agent which we have under our control.”—*Appendix to M. RICHERAND’s System of Physiology, by JAMES COPLAND, M.D. Lecturer on Pathology and the Practice of Medicine, &c.*

for the purpose that it should so take place, some physiologists have argued that the secretion proceeds entirely from the arterial blood circulating in the hepatic artery, which the former class of physiologists considers to be destined solely for the nourishment of the liver.

The interesting investigations into the structure of the liver, lately entered upon in Germany, may throw considerable light upon this difficult and important subject; we shall therefore state the result of these as succinctly as possible:—The internal structure of the liver is essentially granular, or consists of minute grains, connected by means of the ultimate terminations of the portal vein and the hepatic artery, and by the radicles of the hepatic vein and ducts, together with fine cellular substance, forming the matrix or medium of union for the whole. These granula or grains are in various parts separated by means of the branches of the portal vein, hepatic artery, hepatic vein, and hepatic ducts, which must necessarily pass between them in their courses either to or from these granula upon which they are ultimately ramified, or from which they take their origin.

To those granula or grains the minute and ultimate ramifications of the portal vein are destined, and to them also proceed the minute branches of the hepatic artery: both these either terminate upon the surface of the granula in the radicles of the hepatic vein, or they unite to form these radicles before they reach the granular structure; but in every instance the minute terminations of the vessels transmitting blood, and the minute radicles of the vein returning this fluid, are in intimate connexion with this structure. As, however, the connexion of the granula is more intimate with the radicles of the hepatic vein than with the terminations of the portal vein and hepatic artery in these radicles; and as the extreme ramifications of the two latter often unite to form the radicles of the former vessels before any intimate connexion takes place with the granula,—so it may be presumed, that both the arterial blood conveyed by the hepatic artery, and the venous blood circulated by the portal vein, are supplied to those granula, and in a combined state, for the purposes which they perform.

Not only do the extreme ramifications of the portal vein and hepatic artery unite and terminate upon the granula in the radicles of the hepatic vein, but the radicles of the hepatic ducts also commence in these granula. Thus, the granular structure of the liver receives the extreme ramifications of two sets of vessels, the portal vein and hepatic artery; and their terminations give rise in this structure to the radicles of two other sets of vessels, the hepatic veins and the hepatic ducts: the former convey venous and arterial blood, which commingles in the granula; the latter return from the granula venous blood and bile respectively.

From these facts it may be inferred, that the granular structure is the secreting part of the liver, around which the ramifications of the vena portæ and hepatic artery are grouped, as the conducting and preparatory apparatus. The more intimate connexion which the granula have with the radicles of the hepatic vein, renders it more probable that the bile is separated by them from the blood which has actually arrived within these radicles, than from that which circulates in the extreme ramifications of the vena portæ and hepatic artery.

These investigations may, therefore, be regarded as having set at rest the long-agitated question respecting the vessels secreting the bile, since they shew that the terminations of both the vena portæ and hepatic artery meet in the granular structure of the liver, and that they combine to furnish materials for this secretion, which is produced by the granula from which the radicles of the hepatic ducts arise.

Having stated what seems most deserving of notice as to the vessels more immediately concerned in the secretion of bile, it may be proper to remark, that this fluid, as conveyed from the granular structure of the liver secreting it by means of the hepatic ducts, is generally bland and perfectly fluid. It possesses also these characters when it flows directly through the hepatic and common ducts into the duodenum, and when the functions of the liver are performed regularly and healthily. When, however, the bile does not flow

at once into the duodenum, but passes into the gall-bladder, its sensible properties soon become changed in this receptacle; and the change is frequently in proportion to the length of time it remains there. It now becomes much more consistent, deeper in colour, and more acrid. But changes of a similar description to these, although less in degree, not unfrequently take place in the bile whilst it flows from the granular structure of the liver through the hepatic ducts to the duodenum or gall-bladder, as its destination may be. In many instances of *post mortem* examination, made a few hours only after death, we have found the bile in the larger ducts running through the liver evidently inspissated, of a darker colour, and acrid, whilst in other cases it has been comparatively bland and fluid. Several instances of this will come under consideration in the sequel.

If, then, the bile is secreted in a state of comparative mildness and fluidity during the healthy state of the liver, how comes it to change its characters in the gall-bladder and in the liver itself? 1st. With respect to its change in the gall-bladder, this may be explained by inferring that an absorption of its more fluid parts takes place during its remora in this receptacle, and that some change supervenes in its more active constituents, in consequence of which it gradually becomes possessed of the properties which it evinces under such circumstances. 2dly. As to the possession of these properties whilst yet in the liver, this circumstance can only be explained by the condition of the hepatic circulation and of the vital operations of the organ, either previously to, or co-existent with, this particular state of its secretion.

In cases of torpor of the liver and languid circulation in the vena portæ, and during congestion of the veins of this organ, the bile is very probably secreted of a morbid or vitiated character; or, although it may not be exactly such at the time of secretion, it may be more disposed to assume this quality during its passage along the ducts running in the substance of the liver. In circumstances of torpor of the liver, with languid circulation in the vena portæ, it can scarcely be supposed that the same condition does not extend itself to the branches of the hepatic duct. Indeed, it seems more correct to infer that this slow or impeded circulation is actually attended with congestion

of bile in these branches; that during this congestion the more watery parts of this secretion are absorbed; and that the bile virtually undergoes, before it reaches the duodenum or gall-bladder, a similar change to that which it would have experienced during its remora in this receptacle. In cases of obstructed or impeded circulation, or even of congestion in the hepatic vein, a similar condition of the branches of the hepatic duct may be inferred, inasmuch as they both frequently depend upon the same causes, whether these causes belong to diminished energy of the organ, or mechanical obstructions of their respective trunks, or of parts influencing the functions of these vessels.

From these remarks it will appear that we consider the bile,—1st, to be secreted of a mild and bland description during the healthy condition of the liver, and especially in temperate or cold climates; 2d, that it may even possess these properties in a considerable degree as it flows into the duodenum; 3d, that it becomes more or less consistent, acrid, or stimulating, during its remora in the gall-bladder; 4th, that, owing to the condition of the blood generally, or of that portion of it circulated by the vena portæ, the bile may be secreted of a more acrid or vitiated character, or it may more readily assume this character soon after its secretion, and whilst yet in the branches of the hepatic duct; 5th, that this character may often arise from torpor of the vital energy of the liver, or an obstructed or impeded circulation of the vena portæ, or of the hepatic vein; 6th, that it is often accompanied with congestion or obstruction of the hepatic ducts, similar changes taking place in the bile, during its congestion in the branches of the hepatic duct, to those supervening in the gall-bladder; and 7th, that this loaded and congested condition of the branches of the hepatic ducts often exists to a very great extent, as we have ascertained by frequent dissection (as will be demonstrated in the sequel), and that this condition may be termed congestion of bile in the liver.

Having treated of the function which has been considered as properly belonging to the liver, we next proceed to inquire whether or no this important organ performs any other part in the economy. But before this inquiry can be entered upon, it will be necessary briefly to consider the important fact, that a

portion of the materials absorbed from the digestive tube is either removed by means of the radicles of the mesenteric veins themselves, or by means of absorbents or lacteals running to these veins, or by a communication existing in the mesenteric glands between the veins and absorbents. Any one of, or even all these operations may go forward; but that some one of them actually has place in the economy, cannot be disputed, since various heterogeneous matters introduced into the digestive tube, as well as chyle itself, have been very satisfactorily traced in the mesenteric veins, and in the blood taken from the trunk of the vena portæ. The fact, that a portion of the materials taken up from the digestive canal is carried directly into the blood which flows into the portal system, by no means ought to preclude our belief that another, and perhaps a larger, portion of the absorbed materials is conveyed through the lacteal trunks to the thoracic duct. This latter channel, however, seems insufficient for the transport of the whole of the chyle and other matters carried from the digestive organs into the blood; and when viewed as the chief road by which substances received into the circulation can enter, it bears no relation either to the quantity and variety of these substances on the one hand, or to the numerous sources of waste existing on the other, which the former is constantly called upon to supply.

Viewing, therefore, the blood carried into the liver by the vena portæ as containing a considerable portion of absorbed materials, some of them of a more or less heterogeneous description, others of them more or less animalised, — facts sufficiently proved by observation and experiment, — it cannot be considered as stretching the inference beyond what the laws of the animal economy seem to warrant, if we conclude that these materials are assimilated with the blood during their circulation in the liver, and that, in addition to secretion, this organ performs an assimilating function. Notwithstanding the importance, to the pathologist and practitioner, of ascertaining, as far as is in his power, the real extent of function which the liver performs, it seems to have been utterly neglected. This has been owing to the belief, which was long entertained, as to the absorption of the chyle and other materials from the digestive canal. This function being long supposed to reside in the lacteals alone, and it being considered that the only route by which fluids of any description

could reach the blood from the stomach and intestines was by the thoracic duct, the lungs were considered as the only assimilating organ, and no part of this latter operation was imputed to the liver, although every consideration derived from its situation and comparative anatomy seemed to point to it as an important instrument of the process. Dr. Copland, in his *Physiological Notes* already referred to, is the only writer with whom we are acquainted who has considered this subject in its proper light. He states that, "It seems most probable, reasoning from the facts ascertained respecting absorption, that the blood which circulates in the vena portæ being that which is possessed of the venous characters in the highest degree, and which, moreover, has a considerable portion of new materials—the products of digestion and absorption—poured into it before it reaches the liver, undergoes there those changes which are necessary to a perfect assimilation of these materials, and to the future offices which the blood itself has to perform in the animal economy; and that, in the course of, or in addition to, these changes, the blood of the vena portæ has certain of its elements eliminated from it, the elimination of which is requisite, not only to the accomplishment of these changes, but also to the production of a secretion which performs certain important offices in the process of digestion."

It has been very generally admitted, that the functions of the *pancreas* are subsidiary to digestion in the small intestines, and that the pancreatic fluid, which is poured into the duodenum with the bile, assists the latter in the offices which it performs, and which will come more fully under notice in the next section. With respect to the distinctive characters of the pancreatic fluid, as far as it has been examined by modern experimenters, it may be remarked, that it very closely resembles the saliva. It seems to be secreted in sparing quantity; but when the pancreas is excited by certain medicinal substances, the quantity of fluid which it produces seems to be much increased. Of this, however, we have insufficient data for decision; yet, from the phenomena observed to follow upon the exhibition of mercurial remedies, and from the species of diarrhœa supervening upon the sudden suppression of mercurial ptyalism, we are inclined to infer that the pancreas may be excited to increased secretion, as well as the salivary glands. It is true that the situation

and connexions of this organ prevent us from obtaining sufficient evidence respecting the exact nature and extent of its functions and of its diseases; but the above inference, from the facts daily coming before us, cannot be disputed; and it seems to us that this secretion operates very energetically as a solvent of these portions of food which have passed the pylorus in a state of imperfect chymification, fitting them to be acted upon and changed into healthy chyle by the bile. How far it excites the intestines to a state of regular and healthy peristaltic action, or whether an increased secretion of it occasions increase of the intestinal functions, are matters not easily admitting of solution. Much will evidently depend upon its quality as well as quantity; but it must be admitted that these effects may be imputed to it with as great propriety as they have been to the bile; for the evidence in behalf of the one is no stronger than for the other.

The *functions* of the *spleen* are less important to our present researches than those of the liver and pancreas. They have been long, however, subjects of interest with the physiologist, and that interest has not been diminished by the obscurity in which they have been more closely veiled than any others of the animal economy besides. The view which will be here shortly taken of the spleen will have as close reference to its pathology as to its physiology: of the former we know a little, particularly in the grosser or more tangible relations of the subject; of the latter, our knowledge is smaller in amount, and less positive and precise in its nature. It, notwithstanding, appears to perform a part of some considerable importance in the animal economy, as must be apparent from its size, situation, and connexions. According to the observations of MM. Béclard and Defermon, this viscus presents an actual and evident motion of expansion and contraction. Its structure has not been ascertained with sufficient accuracy, but it appears to consist of a minute and infinite interlacement of arteries, veins, and lymphatics. Its blood-vessels are endowed with a faculty of dilatation under certain conditions of the adjoining parts, so as to allow accumulations of blood to take place within it to a very considerable extent, without material injury to itself or to the body. This is particularly remarkable during the cold fits of agues and other diseases. The numerous convolutions of the capillary vessels forming the greater part of the

internal structure of the spleen have interstices between them, according to the observations of Sir Everard Home, which are filled by a reddish coagulating serum, poured into them from the convoluted blood-vessels; and this serum is removed by the numerous branches of one large absorbent, which opens into the thoracic duct.

From this structure, and from other considerations as to its comparative conditions and relations, it may be inferred,—1st, that the spleen performs a subservient part to digestion, the flow of blood being determined, in a greater or less degree, either to the stomach or to the spleen, according to the condition and wants of the system, and as the nerves of the one or the other are more strongly excited; 2d, that the serum which is elaborated from the arterial capillaries of the spleen, and which is taken up by the radicles of its large absorbent vessel, and carried into the thoracic duct, is for the purpose of animalising or assimilating more fully the chyle; 3d, that it permits, in consequence of its peculiar texture, accumulations of blood to take place within it, during certain states of disease, particularly when the circulation is suppressed upon the surface of the body, and determined to the internal parts, and that it thus prevents more vital organs from suffering that injury to which their structure renders them more obnoxious. These accumulations and congestions of blood in the spleen, when of frequent occurrence, as during agues of long standing, and during the continued influence of noxious terrestrial exhalations upon the system, often terminate in chronic inflammation, or in obstructions of this viscus. It not unfrequently happens that, under the last-named circumstance, particularly in some situations, the frequent and unnatural distension of the spleen during the cold fits of agues, so completely overpowers its tone and energy, that it becomes soft and friable in its texture; and it has even been ruptured by the sudden determination of blood towards it during this stage of the disease, notwithstanding the firm envelop surrounding it. These conditions of the organ will come under consideration more fully in the sequel.

SECTION III.

Of the Functions of the Duodenum and Small Intestines, or Chylification.

HAVING taken a brief view of those viscera which immediately surround the stomach, and perform subordinate, although by no means unimportant, parts in the digestive and assimilating processes, we have next to offer some remarks on the process of chylification.

Under ordinary circumstances, the *chyme*, as soon as it has passed the pylorus into the duodenum, begins to assume the character of *chyle*. As the duodenum becomes distended by the chyme poured into it, the flow of bile from the common duct, and of the pancreatic juice, is accelerated; and these secretions mix with the chyme, particularly in the sacculated and depending angle of the duodenum, and are instrumental in the change which is produced in it. This admixture having taken place, the resulting materials, in the lower portion of the duodenum and jejunum, are chyle mingled with excrementitious matter, the former of which may be traced, by means of glasses, ascending the lacteals: the latter, of which the follicular secretions and more acrid part of the bile are a portion, is carried onwards along the intestinal canal. The motion of the diaphragm during respiration tends to promote the complete admixture of the substances poured into the duodenum, which substances may be enumerated as follow:—the chyme, the bile, proceeding directly from the liver and from the gall-bladder, the pancreatic secretion, and the secretion of the mucous follicles with which the pylorus and duodenum are abundantly supplied. All these being poured into the duodenum nearly contemporaneously, their admixture and mutual action are thereby rendered more perfect, whilst the bend formed by this viscus delays the progress onwards of its contents, gives time for the requisite changes to take place in them, and allows more fully the absorption of the chyle, the product of the whole

operation, to proceed, by means of the numerous lacteals with which it is supplied.

The process of chylification is performed chiefly in the duodenum ; but, doubtless, this operation proceeds also to some extent in the jejunum and ilium, particularly when the contents of the duodenum are propelled onwards before the changes requisite to chylification in this part of the tube are complete. The absorption of the chyle begins in the duodenum, proceeds rapidly in the jejunum, and to a less extent in the ilium. The duodenum and small intestines, but more especially the former, are copiously supplied with nerves. Those of the duodenum have intimate connexions with the stomach, liver, gall-bladder, and ducts, and with the pancreas—a circumstance of great importance in the consideration of the physiological and pathological relations of this part of the digestive organs. The villositities, also, of the duodenum and small intestines serve to increase the extent of surface on which the operations of these organs are performed : and as this surface, whether denominated the mucous or villous coat, or called by any other name, is continuous throughout the canal—is supplied, particularly in the parts more immediately under consideration, with nerves intimately connected with each other ; and as the same kind of surface extends along the interior of the biliary ducts into the gall-bladder, it seems obvious that the impressions made by substances received into the duodenum must be transmitted, to a greater or less extent, to these parts with which it thus holds so intimate a relation. Thus, substances which excite or irritate the internal surface of the duodenum, will, owing to these nervous connexions and extension of surface, also excite the gall-ducts, the gall-bladder, and even the liver and pancreas. This extension of action characterises many of the substances employed in medicine and for dietetic purposes ; and it is from a knowledge, derived from observation, of the respective qualities of each in this respect, that we are enabled to prescribe them judiciously, and to treat successfully the various forms of disease which come before us.

The same connexions, which thus render the effects of remedies more extended and complicated, tend also to the propagation of disease, and thus

demand from us a due consideration, as respects both the recognition of the disordered conditions of these viscera, and the means best adapted for their removal.

In conclusion, it may be remarked, respecting the process of digestion in the small intestines, or chylifaction, that it is by no means a chemical process ; for there subsists no chemical relation between the chyme and the biliary and pancreatic juices, which are the materials whence chyle is formed. This process is altogether a vital one, and, like the production of healthy chyme in the stomach, under the influence of the vital condition of the organs instrumental in its formation. When the secretions poured into the duodenum are deficient, or excessive in quantity, or deranged in quality, it is obvious that the digestive function in the small intestines must be disordered accordingly. Such disorder is indeed of very frequent occurrence ; and the observing practitioner may often be able to trace, by concurrent signs, the specific cause and pathological state. On some occasions he will infer, that the energies of the stomach and duodenum being exhausted, the substances received into them do not undergo the requisite changes, but frequently form new combinations to which their constituent elements are chemically prone, and which irritate and inflame the surface with which they are in contact. On other occasions, he will be induced to conclude, from a careful comparison of symptoms, that the secretions which are poured into the duodenum are deficient in quantity, or even vitiated in quality, thus imperfectly performing the purposes for which they are intended. At another time he will rationally infer, that the bile which has been long congested in the ducts, running through the liver, or pent up in the gall-bladder, has been let loose, and, owing to the more acrid properties it has acquired during the term of its congestion, is now irritating the duodenum and small intestines, exciting sympathetically the stomach, owing to the nervous connection and extension of surface to which we have already alluded, and stimulating the whole canal through which it passes, and even exciting the surfaces over which it flows, or with which it remains for any time in contact, to inflammatory action. These are matters at which we now throw merely a passing glance, but to which we shall direct much patient attention in the sequel.

SECTION IV.

Remarks on the Functions of the Cæcum and Large Intestines, or Fæcation.

THE *cæcum*, both as respects its functions and its diseases, is an organ which has not yet received that degree of investigation which it seems to deserve. As respects many of its pathological conditions, it will often come under consideration in the sequel. As regards its functions, certain particulars may be adduced, which appear, both from experiment and observation, to be satisfactorily made out.

The resemblance of the *cæcum* to the stomach in most of the graminiferous, and particularly the ruminating animals, as well as its form and situation throughout all the higher classes of the animal kingdom, are circumstances which sufficiently shew it to be a reservoir in which the last act of digestion is performed. This was the opinion of Viridet*, and it is fully confirmed by the able and recent researches of Tiedemann and Gmelin on digestion in the four classes of vertebrated animals.

The situation of this viscus, its capacity, particularly in some animals, the circumstance of its contents having to advance, in opposition to their gravity and its attachment to the parietes of the abdomen, are proofs of a much slower circulation of the intestinal contents through it than through any other part of the canal, and confirm the view which has been taken as to its being, in some respects, a reservoir, in which is poured that portion of the materials remaining

* Sed de intestino cæco quidquam dicere præstat, cum in quibusdam animalibus sit summe necessarium, nempe quibus est amplissimum, forsanique vicem alterius ventriculi gerit: nam glandulis crassioribus donatur, quorum succus solutione heliotropii rubescit, et solutione sublimati albescit, suisque salibus acidis et volatilibus præditum est."—*De Primâ Coctione*, p. 270.

in the ilium, and which effects the last change in them which they are destined to undergo for the purposes of digestion and nutrition.

Besides the proofs in support of this opinion which have been now adduced, it may be important to state, that this viscus is abundantly supplied with large follicular glands, which, according to the experiments of Tiedemann and Gmelin, secrete an acid, albuminous, and solvent fluid, which mixes with the remaining aliments poured into it from the ilium, and which promotes the digestion of those portions which have withstood the digestive process in the stomach and small intestines, or have been insufficiently changed in their transit through them for the purposes of absorption and nutrition. In order that this office may be more completely performed, as well as another function which will soon come under consideration, the materials poured into the cæcum remain a greater or less time; so that Nature seems to make a last effort, by means of this part of the large intestines, to obtain the remaining nourishment from the intestinal contents.

But, whilst the cæcum performs the last act of digestion, it seems at the same time to commence the first part of *fæcation*; for it is only in the cæcum that the intestinal matters assume a fæculent odour. The contents of this viscus are generally of the consistence of a soft *bouillie*, of a brown or brownish-yellow colour, with a fæculent smell. This odour, according to Tiedemann and Gmelin, proceeds from a volatile oil, which is apparently secreted chiefly in the cæcum.

During these changes, which are effected by the cæcum on its contents, an acid and hydro-sulphurated gas is disengaged from them. This gas seems to be generated only in small quantities during the healthy function of this organ; but when the vital energies of the viscus is diminished, and when, consequently, more or less of a remora of its contents takes place beyond what they generally experience, this gas is disengaged in much greater quantities; so that it becomes distended to an extent which is injurious to its healthy tone. In many cases, it re-acts on the distending power; and thus the flatus, with the other materials contained in it, are propelled along the colon: but

on many occasions, and under particular circumstances, considerable opposition is offered to their transit about the right flexure of this latter viscus; and hence it may rationally be inferred, pain and uneasiness are frequently produced in this part of the colon, as well as in the cæcum, giving rise to the belief, in the minds of those who view the ailments of such patients superficially, that they are labouring under hepatic disease. It is true that very frequently the particular condition of the cæcum now under consideration is sometimes complicated with chronic hepatic disorder; but the existence of such complication could not be understood, unless the practitioner was already aware of the nature of the former derangement.

When, also, attention is not paid to the first call to stool, an impediment is thus placed in the way of the passage of its contents along the colon, and obstruction and distension of the cæcum are thus either occasioned, or increased if it previously existed.

Occasion may now be taken to observe that, under circumstances which cause the remora or stagnation of those materials in the cæcum which are poured into it from the ilium, not only is there a sulpho-carburetted hydrogen gas disengaged from them, occasioning distension and other derangements; but they experience considerable changes, becoming more irritating and noxious to this viscus itself, and inducing chronic inflammatory action in its mucous coat.

Under other circumstances of protracted disorder of the digestive apparatus, as when acidity is generated in the stomach and small intestines, owing to imperfect digestion of the food, and when the articles of diet or of drink are of an irritating, or stimulating, or otherwise improper kind or quality, and when the secretions from the liver and pancreas, and even from the mucous surfaces of the small intestines themselves, are of an acid or an irritating nature, then the remora which these materials experience in the cæcum, and the time which they hereby have to act upon its internal surface, are often productive of disorder of its function and of its internal structure. This is of frequent occurrence in all climates, but more parti-

cularly so in warm countries. And the disorder, which at first consisted merely of functional disturbance, passes in process of time, owing to the continued operation of the efficient causes, to structural derangement. Such, in fact, is daily observed to be the course of events in many of the cases of chronic diarrhœa and dysentery which are met with in warm climates. The time which the various excrementitious matters and morbid secretions remain first in the cæcum, and afterwards in the sigmoid flexure of the colon and top of the rectum, before they finally pass off, induces, in these situations particularly, considerable excitement and irritation, running into inflammation of the mucous membrane and follicles, and terminating in ulceration. These are topics to which we merely advert at present; they will become the subject of demonstration in the sequel.

In its course through the duodenum and small intestines the chyme is converted into chyle, by the action of the more bland portion of the bile and the pancreatic juice, as we have already seen; and the greatest part of the chyle thus formed is absorbed and carried into the circulating fluid. The excrementitious portions of the aliment, with the remaining chyle, the more acrid parts of the bile, and some mucous secretions, are poured into the cæcum, where they remain for the purposes already noticed. Having undergone, in this viscus, the requisite changes, and received an admixture of its secretions, these materials are next carried onwards through the colon. The fæcal character which they acquire first in the cæcum becomes more marked as they proceed onwards; and the sacculated form of the large intestine, most prominent in the cæcum, and more or less so throughout the colon to the rectum, together with its flexures, tend to retard the progress of its contents, and to promote the absorption of the remaining chyle, and of their more fluid parts. At the same time that the process of absorption is going forward in the large intestines, (to a less extent, indeed, than in the small,) a copious secretion takes place from the mucous follicles with which their internal surface is studded, which secretion is partly excremental, and partly for the purpose of protecting the inner membrane from the irritation which the contents of the intestine are often calculated to produce, and of facilitating the progress of the fæcal mass along the various windings of the colon, and over the different valvular folds into which it is

frequently thrown, when the contraction of the longitudinal bands of muscular fibres with which it is provided is either inordinately great or frequent.

When the fæcal contents at last reach the rectum, they then consist chiefly of the excremental parts of the aliments, and the more solid and acrid portions of the biliary and mucous secretions poured into the intestinal canal, partly in order to be excreted, and partly for the purpose of exciting its functions. The secretions from the follicular glands of the cæcum, colon, and rectum, give the fæces their peculiar odour.

Gaseous substances are formed in greater or less abundance in the small and large intestines, particularly in the latter. These gases may come from more than one source. They may proceed from the change which the alimentary substances and secretions undergo in their course; or they may even be secreted by the mucous membrane itself, particularly when it is in a state of irritation or chronic or sub-acute inflammation. It is probable, then, that these gases proceed from both these sources,—from the former particularly when the vital functions of the cæcum and colon are torpid, and when the fæcal mass is retained long in these situations, or when they are loaded with their contents,—and from the latter, under the circumstances already alluded to, and which will be considered when the diseases of these parts are treated of.* The author of the notes upon physiology, already quoted, offers the following remarks on this subject, which we may adduce in support of our opinion:—“ We believe that the mucous membrane of the digestive canal may both secrete gaseous substances and absorb them; and we found our belief upon the following circumstances:—1st, We have

* *The gases in the intestinal canal* may, from what has been adduced above, be ascribed to three sources:—1st, From the common air swallowed with the food; 2d, From the decomposition of the intestinal contents; and 3d, From the occasional secretion of gas from the mucous surface of the tube.

The gases from the first source are found chiefly in the superior portions of the canal; those from the second source in the lower part; and those from the third, are by no means limited in their situation. It is reasonable to suppose that a large proportion of the azote and carbonic acid is derived from this last source.

From the experiments of Magendie and Chevreul, who examined very soon after death the

proofs derived from experiment and observation that gaseous substances are absorbed and given off from the mucous membrane of the respiratory apparatus. 2d, Pathological facts intimately connected with the functions and properties of this membrane in different parts of the body support the position. We have, however, no doubt that the changes which the alimentary substances undergo in the stomach occasionally gives rise to gaseous products; and we believe that a similar result follows the remora of the excremental matters in the colon and rectum."

There is one important consideration, which must not be overlooked in its connexion with this part of our subject; and that is, the derangements of the digestive process resulting from the accumulations of gases in the in-

gaseous contents of the stomach and intestines of four criminals executed at Paris, the following appear to be the proportions and the relative quantities in the different portions of the canal.

1. <i>Gases in the Stomach.</i>		2. <i>Gases in the small Intestines.†</i>			
Oxygen*	11.00	Oxygen ...	00.00	..	00.00 .. 00.0
Carbonic acid	14.00	Carb. acid .	24.39	..	40.00 .. 25.0
Hydrogen	3.55	Hydrogen .	55.53	..	51.15 .. 8.4
Azote	71.45	Azote ...	20.08	..	8.85 .. 66.6
	<hr/>		<hr/>	<hr/>	<hr/>
	100.00		100.00	100.00	100.0
3. <i>Gases in the large Intestines.</i>					
Carbonic acid.....	43.50	70.0		
Hydrogen and carburetted hydrogen	54.7	11.6		
Azote	51.03	=	100.00	18.4	= 100.0
4. <i>Gases in the Cæcum.</i>		5. <i>Gases in the Rectum.</i>			
Carbonic acid .	12.5	Carbonic acid	42.86		
Hydrogen	7.5	Carburetted hydrogen	11.18		
Carburetted hydrogen	12.5	Azote	45.96		
Azote	67.5		<hr/>		
	<hr/>		100.00		
	100.0				

(*Ann. de Chim. et Phys.* ii. 292.)

* The oxygen seems to be absorbed by the blood before it reaches the small intestines.

† Results in the different individuals.

testinal canal, particularly in the cæcum and colon, and from the infarction of fæces in the same situations. There is nothing, perhaps, tending more to diminish the tone and vital energy of the large intestines, and consequently to facilitate accumulations of fæces and flatus in the cæcum and colon, than want of attention to the earliest calls to stool. When these intimations are not attended to, a stop is put to the progress of the fæcal contents along the whole line of the canal. The remora gives rise to the extrication of flatus, which, with the distention occasioned by the fæcal accumulation itself, distends the colon and cæcum; and these distended viscera press upon and impede the functions of the duodenum, small intestines, and stomach, occasionally even impeding the flow of bile from the ducts. This is a matter of importance in almost all the disorders of warm climates or hot seasons, and should receive due attention both from the practitioner and from the patient himself.

From what has been advanced, it is inferred that the greatest part of the ingesta is more or less changed and absorbed into the blood during the passage along the digestive canal, although this process advances more or less rapidly in one situation than another. The extent to which absorption from the digestive tube takes place will become manifest when the quantity of those substances which are daily taken into the stomach is compared with what passes off by stool; and the disproportion between them will serve to indicate the quantity absorbed. When, moreover, it is considered that the greater part of what is passed by stool is actually the excrementitious portions of the various secretions poured into the digestive canal, the quantity of the ingesta which is absorbed into the circulation will appear, as indeed it is, still greater. Now, as but a very small proportion of the ingesta passes off directly by stool, and as all that is removed from the digestive organs must necessarily be carried into the blood before it can pass from the system by any other route, it therefore follows, that a great quantity and variety of substances, more or less changed in their natures, must necessarily pass into the circulation; and that, as this passage must be made in a certain given time, owing to the regular and continued ingestion of substances into the stomach, the routes by which it takes place must necessarily bear some pro-

portion, either as respects their number or size, to the quantity passing through them in a given time, and to the celerity with which the passage is made. If the routes be narrow, they must, in order that the transfer may be made in a certain time, be proportionally numerous, and meet with few obstructions in their course. Before the revival of the old opinion regarding absorption by the veins, the generally received idea, that all substances carried into the circulating system from the digestive organs could arrive there only by the thoracic duct, was formed without considering the incompetency of the means to the end: and it has not, until very recently, been shewn that the routes, by which the various substances carried into the circulation were adequate to the purposes assigned them, under the numerous modifying circumstances to which they are exposed. For in place of a single passage through the thoracic duct, the experiments of Magendie, Tiedemann, Gmelin, and various other physiologists, have shewn, as has been already stated at p. 29, that a considerable portion of the substances removed from the digestive tube is carried directly into the blood of the vena portæ, either by means of an absorbing faculty possessed by the radicles of the mesenteric veins, or by absorbing vessels opening directly into the branches of those veins in some part of their course.*

* The above-mentioned physiologists conceive that the substances conveyed from the digestive tube directly into the blood, which is sent to the liver by the vena portæ, are actually imbibed by the radicles of the veins themselves. The opinion, however, argued for by Dr. Copland, in his physiological notes, seems to us more conformable to the functions of the veins and absorbents respectively, and to what actually takes place in the more perfect animals: at the same time, it appears to be a more legitimate inference from the experiments which these physiologists performed. Dr. Copland contends† that there are lacteal and lymphatic absorbents which run directly into venous branches without passing previously through absorbent glands; and that this conformation is very remarkable in the digestive organs; there being numerous lacteals which, at longer or shorter distances from their origins, open into the mesenteric veins, and convey the substances they have absorbed directly into the blood sent to the liver in the portal vein.

† Notes on absorption, in the Appendix to the last Edition of Richerand's Physiology.

Reasoning, therefore, from the circumstances now stated, namely, the great quantity and variety of the materials, notwithstanding the changes effected in them during the process of digestion, which are necessarily conveyed into the circulating mass of fluid, and the fact that a great portion of them is directly conveyed into the blood sent to the liver, in the vena portæ, we are led to conclude, with the physiologist, whose opinions we have already quoted, that the liver performs an assimilating function as regards these substances, in addition to its secreting office: and farther, that, owing to the causes of irritation and excitement presented to it, in the numerous heterogeneous and stimulating substances too frequently constituting the ingesta, it is the more subjected to disorder of its functions, which, by repetition or the intensity of the causes, at last terminates in inflammations, congestions, and structural disease, as will be fully illustrated when we come to treat of the disorders of this important organ.

CHAPTER II.

GENERAL VIEW OF THE CAUSES CHIEFLY PRODUCTIVE OF DISEASES IN WARM CLIMATES, PARTICULARLY IN INDIA.

BEFORE the more prevalent diseases of warm countries be individually treated of, it will be advantageous to take an intimate view of those causes, to which the prevalence of disease in warm climates, especially amongst their European and unseasoned inhabitants, are to be imputed. The obvious advantages resulting from this arrangement are, that those causes being definitely assigned, and brought under immediate view, their effects may be more readily inferred, and the means of removing them, or of counteracting them when they admit not of removal, may be pointed out with stronger hopes of receiving due attention from those for whose benefit the remarks respecting them have been made.

In this Chapter will be considered, as fully as may seem requisite, 1st, The most productive sources of diseases in warm countries, and in hot seasons in temperate climates, namely, exhalations proceeding from the soil and decayed vegetation under the various circumstances favouring their extrication; and, 2d, Those causes of disease which operate by disposing the system to become affected by the former more efficient class of causes, and which belong chiefly to the important topics of diet and regimen. These subjects will be treated of under different heads, as the varying relations of the topics and their importance individually require a separate and full investigation for each of them.

SECTION I.

Of those Causes of Diseases in Warm Climates which proceed from the Situation, Soil, and Vegetation, of a Country.

OF all the numerous causes of disease to which the human species is liable in warm climates, those which are now about to be considered are the most important ; and they will require from us an investigation full in proportion to the extent and variety of the effects which they produce.

When the obvious and intimate relations subsisting between the earth's surface and human species, for whom its beauties and its deformities are destined by Providence, — between man and the soil on which he moves, the productions of the earth which surround and feed him, and the air which he is constantly inhaling into his body, — the conditions of these agents, as far as they can be recognised by sensible properties, or inferred from their manifest effects, become matters of immense interest in medical science, and of surpassing importance, in philosophical, civil, and political points of view. The conditions of the atmosphere resulting from the states of, and the changes taking place within and upon, the soil covering the torrid and temperate zones of the globe, are not only the chief and immediate sources, on the one hand, of the strength and perfection of the mental and corporeal constitution of man ; and, on the other, of the diseases which harass him, stunting his physical and moral growth, or sweeping him from amongst living animals, of which he is the head and master ; but are also the most productive, although the more remote causes of national character — of advancement in all the arts, sciences, and refinements of life in some countries, and of moral and physical debasement in others. In one, their beneficent operation may be traced in the freedom, prosperity, and greatness of its inhabitants ; in another, their noxious influences are manifest in the degenerate and debased condition of the species, whose wants, habits, enjoyments, and desires, seldom surpass those

of the higher animals. In short, the constitutions of the atmosphere derived from soil and situation, according to their nature, are not only the productive sources of disease, but also the chief spring of the perfection of the human frame, and of its degeneracy—the influential causes of the various degrees of human science presented to us in the different kingdoms of the world—of the freedom and greatness of nations, and of their enslaved and degraded conditions—of the rise and downfall of empires. They should equally interest the scientific physician, the philosopher, the enlightened legislator, and the arbiters of the fates of nations.

SUB-SECTION I.

Of the Soils and Situations productive of Miasmata, and Circumstances favouring their Formation.

HAVING touched generally and briefly upon the extensive influence exerted by the states of the atmosphere on the physical and moral constitution and advancement of the species, we now proceed to inquire into the soils, situations, and circumstances, producing terrestrial effluvia, which, mixing with the lower strata of the atmosphere, diminish its purity, and injuriously affect the human frame.

Of the various soils and situations productive of miasmata, the most deserving of notice, are low and marshy places. All situations within the tropics, or the temperate zones, which are low and subject to inundations, and places which are saturated with moisture and abounding with the exuviae of organic substances, are productive of unwholesome effluvia. Argillaceous soils, and the deep and rich alluvial earth which is found in the bottoms of valleys or ravines, and on the banks, or at the mouths of rivers, are also productive of miasmata whenever they are exposed to the action of a powerful sun, particularly after they have been inundated, and when they abound with the remains of a luxuriant vegetation.

We have accounts, in the writings of the ancients, of the insalubrity of situations in temperate climates, such as have been now instanced; and daily observations in the south and middle of Europe, even, furnish us with numerous proofs of the same fact, and of various others closely allied to it, as will be shortly demonstrated. Several instances of the unhealthiness of marshy districts are to be met with in the works of Hippocrates. In his epidemics we are told that the city of Abydos had been several times depopulated by fever, but the marshes being drained by his advice, it became healthy. The majority of the ancient writers present us with facts evidently pointing to the pernicious effects of low and marshy situations. The plague at Athens, which is almost medically described by Thucydides, may be rationally imputed to this source; and the pestilences, mentioned in the Roman writers as having visited Rome, can best be explained by assigning the exhalations proceeding from the surrounding marshes and low grounds, and from the occasional inundations of the Tiber, as their cause. The accounts given by Dionysius of Halicarnassus, by Plutarch, and by Livy, evidently shew that the causes of disease, now coming under consideration, were known both to the historians and physicians of antiquity; and numerous instances may be adduced to shew, that the means of removing and counteracting them were as well understood as at the present day. The lake Averno, mentioned by Virgil, is probably a poetical exaggeration of the effects arising from marshes; and the deeds of Hercules, the metaphorical record of his success in removing these most productive sources of disease. Strabo speaks very confidently of the good effects of the embankments of rivers, of drainage, and roads, in removing the causes of pestilence: and the groves, which were held sacred by the ancients, had obviously, in the majority of cases, the effect of confining the range of the miasmata generated by the adjoining marshes, and of protecting the inhabitants of the towns and villas in their vicinity.

The insalubrity of those situations of which we read in the works of the ancients, is still more fully shewn in the writings of modern observers. And it is probable that those places have actually become more unhealthy than they were in former times, owing to the accession of alluvial soil which they may have received from the higher grounds in their vicinity, and from the

depositions of soil at the mouths of rivers and in the bottom of lakes, thus converting a healthy lake to a marsh; to the removal of those screens or curtains of trees which confined the exhalations to the source that generated them; and to the neglect of those means of drainage and cultivation which a greater population had rendered necessary. If the reader want proofs of this position, he will find them in abundance in the very able and learned works of Lancisi* and Brocchi.† If, then, marshy grounds and deep absorbent soils bearing a luxuriant vegetation in temperate climates are so productive of disease, as the experience of all ages has shewn them to be, how much more insalubrious must similar places prove within the tropics, when the causes of diseases proceeding from these sources, and the susceptibility of those exposed to them, are heightened by a high temperature and great moisture of the atmosphere! — circumstances which will be duly considered in the sequel.

There is, perhaps, no practitioner who has had any extensive experience of the diseases of warm climates, or who has even attended merely to the forms which disorder assumes in hot seasons in temperate countries, that is not fully aware that the majority of the most prevalent maladies within the tropics, more particularly the different forms of fever and dysentery, are chiefly owing to the exhalations proceeding from marshy situations and from vegetable matter in a state of decomposition. These causes, it must be admitted, often require adventitious circumstances to bring them into active operation, or to promote and heighten their influence upon the system; but still they are the efficient causes, without the existence of which these diseases, and some others intimately related to them, would appear but seldom. Such, then, being the extensively baneful operation of terrestrial exhalations in vitiating the air, and through it of producing sporadic, endemic, and epidemic maladies, the importance of examining into the situations and circumstances usually productive of these exhalations, and of considering various

* *Lancisi, J. M. de Noxiis Paludum Effluviis, eorumque Remediis, libri duo.* 4to. Romæ, 1716, 1717.

† *G. Brocchi, Considerazioni sull' Agro Romano Antico, e sul Sito di Roma Antica.* 4to. Rom. 1826.

————— *del Stato Fisico del Suolo di Roma.* 4to. Rom. 1820.

topics connected with their propagation, modes of acting, and the means of limiting their formation and sphere of action, seems most apparent. This we shall attempt, as far as the nature of the present work will permit.

It has been already stated, that all places which are relatively low and saturated with moisture, and abounding with the exuviae of vegetable and animal substances, — that all rich, deep, wet, moist, marshy, clayey, and absorbent soils, covered by a luxuriant vegetation, — are productive of malaria whenever the temperature of the atmosphere is considerable, or whenever they have been exposed to the action of a powerful sun. At what temperature the extrication of the noxious effluvia commences, it is difficult to determine: but it seems evident, from a review of the diseases met with in the vicinity of situations such as have been now mentioned, in different countries, and at various temperatures, that noxious exhalations may proceed from them as soon as the temperature rises a few degrees above the freezing point, provided they abound with vegetable matter in a state of decay; and that these exhalations are more abundant, and their effects more marked and deleterious, as the temperature of the air increases, and in proportion as atmospheric heat is combined with moisture. In intertropical countries the noxious influence of the air in marshy and low situations, particularly at sunset or rise, is particularly well marked. This is owing to the rapid decomposition which organised substances experience under an elevated temperature joined to moisture — the moisture existing in the air holding in solution or suspending those terrestrial emanations which a soil, abounding with vegetable and animal remains and with water, had generated by the conjoined influence of a high temperature and of the elements constituting the atmosphere.

In order to become more particular in our inquiries, we shall devote our attention first to the soil and situations most productive of those exhalations which diminish the purity of the air and affect the energies and health of the human species, and which existing in the atmosphere, have been long termed malaria by the Italians; and next, those places in tropical countries, particularly in India, which are most unequivocally the sources of noxious

effluvia; and in the course of our inquiries we shall illustrate the topics embraced by them, with references to places and circumstances more familiar to the reader.

The atmosphere may be considered as the most immediately connected with the continuance of life of all the external agents by which the animal system is actuated; and upon its condition, as respects temperature, moisture, and the admixture of foreign gases with it, depends the health of the species in a most marked manner. As, however, the state of the atmosphere, as regards the relative proportion of those elements constituent of it which are absolutely requisite to life, is always the same in every situation, it follows that it is to those more accidental and fortuitous ingredients which are often present in it, that we must impute those effects with which experience in various climates makes us acquainted. Observation shews us that the air presents various degrees of moisture; that its electrical conditions vary; that it evidently more or less abounds in particular places with exhalations in a gaseous or fluid form given off from the soil or from substances placed in the soil; and that those exhalations accumulate in proportion to the moisture of the air, its temperature, and the degrees of stagnation which it may experience.

The low grounds and marshes in the bottom of valleys and bordering rivers, particularly at their mouths, and which are generally overflowed during the periodical rains of warm climates, are most unequivocally productive of malaria. So evidently is this the case, that few persons visiting such places at the close of the day, during the night or in the morning, escape the effects they usually produce: and there is, perhaps, scarcely an instance of an individual having slept, for even a single night, in a place so circumstanced, without suffering for his temerity. The low grounds at the mouths of rivers, or along their course, are rendered thus particularly insalubrious by the deep, rich, and moist soil which form them; by the quantity of rich mud and slime deposited upon them, particularly after inundations, and by the luxuriant vegetation, part of which must necessarily in a warm climate be always undergoing decay, with which they abound. In these situations, — many of them on a level with the river itself, or but little elevated above it, and in some places even below its usual current, —

there is always a constant supply of moisture, so that the formation of effluvia is constantly going forwards to a greater or less extent. This is particularly the case as regards the Jumna and Ganges. The latter river, more especially during its course through the province of Bengal, presents every condition and adventitious circumstance on which the generation of malaria from its banks can be supposed to depend. The same may be said of the Burrampooter, as it flows through the same province; and there are no rivers of any considerable magnitude within the tropics which do not present us, during some parts of their course, and particularly at their confluences into other rivers, or immediately before they fall into the ocean, with situations on their banks, whence unhealthy emanations are formed by the heat of the sun.

Rivers are, therefore, amongst the most productive sources of malaria, both along their course and at their terminations into the ocean. If rivers, of whatever size, traverse a flat country, and run in a slow and winding direction; if they have their banks covered by a dense underwood, by mud and mangrove bushes; if they overflow their banks and inundate the adjoining country; if they receive the filth and drains of adjoining towns or cities, and carry with them the dead and putrid carcasses of animals, or contain much animal matter in a state of decay,—circumstances which the rivers of the East generally present to the fullest extent,—then may places adjoining them be considered as furnishing the prolific causes of disease; and as being unhealthy in proportion to the extent to which these circumstances exist on their banks and in their immediate vicinity. Where large rivers terminate their course by more than one mouth, as they generally do when they flow through a low alluvial soil, but little elevated above the ocean, as the Ganges, the Irrawaddy, the Indus, the Orinoco, the Danube, the Mississippi, &c., and thereby form low islands, the production of terrestrial effluvia may be there certainly looked for whenever the temperature of the air is high. The islands formed at the mouths of rivers, by the soil washed down by them, owing to their extremely low situation, their rich and wet soil, and their very abundant vegetation, are amongst the most fertile sources of malaria—sources which become still more fertile after inundations or partial overflowings of the ocean; occurrences to which they are more or less subject, particularly during

the monsoons. Many of the islands formed at the mouths of rivers are, in every respect, a marsh; and, indeed, but few rivers are to be met with, particularly in a warm climate, which do not give rise to very extensive marshes in almost every part of their course. Without referring to the more majestic rivers of the East, we may instance the numerous marshes formed by the Danube, particularly in its course through Hungary, and at its termination in the mouths by which it empties itself into the Black Sea — the rivers which pass through the Netherlands and Holland — the Thames below London — and several of the rivers of the south of France and Italy.

The country in the vicinity of rivers, particularly their mouths, are rendered more subject to inundations, from the quantity of diluvium carried down, from the cultivated grounds in their vicinity, by the numerous torrents running into them during the rains and monsoons. The soil and fine sand suspended in the waters of rivers, are deposited as soon as their currents are retarded by admixture with the waters of the ocean, and are thrown back by its surf and waves upon the land in the vicinity of their mouths, and even form sand banks and bars crossing the mouths themselves, obstructing their outlets, and hence inundating the adjoining country. These sand banks and bars, in process of time, increase until they form islands; and, in many places, the sand banks which are thus formed by the action of the surf upon the soil washed down by rivers rise above the level of the adjoining district; so that, if on any occasion the tides have been unusually high, and the waves so great as to overleap this barrier, the country is inundated, the water is prevented by it from retiring with the fall of the tide, and thus the place becomes, in every respect, a noxious salt marsh until the water is evaporated. But it is not whilst the inundation continues that the malaria which is thereby generated is most noxious. During the evaporation of the stagnant water, and whilst the surface becomes gradually exposed to the action of the sun, intermittents and remittents usually make their appearance. But when the soil itself becomes exposed, and has remained so for a considerable time, to the action of a powerful sun, then fevers of a more malignant character frequently seize upon those in its vicinity: and this result is more particularly remarkable if warm weather has been of long and uninterrupted duration, and if the air at the same time has been still and moist.

The marshes formed in the course of rivers, and the low bushes and rank vegetation with which the banks and mouths of rivers abound, are less remarkably productive of disease in temperate and cold climates than within the tropics, and seldom produce those acute forms of disease which a hot country presents us with. It is true that agues of every type, remittents, simple continued fevers, and dysenteries of a mild form, and visceral obstructions, result from them to a greater or less extent, on all occasions, and particularly when concurrent causes are brought into operation. But as exhalations productive of those effects upon the human constitution are either weaker in their nature, or are formed less abundantly, or accumulate to a much less extent, than those given out from similar places in a hot country, disease is less general, less severe in its form, and less fatal.

When the sun's influence has been long powerful, when the atmosphere has been for any considerable time moist and warm, and particularly if it has also been stagnant or nearly so, and little disturbed by thunder-storms, places in temperate and cold countries, such as we have mentioned, become the seats of diseases, similar in all respects to those which are met with within the tropics. Indeed, this approximation of the character of disease, and of its prevalence, as far as the circumstances producing it are similar, is what every rational observer should expect. Instances illustrating the fact are numerous, and may be adduced from every kingdom in the globe. The marshes of Hungary, which usually occasion agues in the spring, are, after a long and hot summer, productive of the same forms of disease to which Europeans are liable soon after their arrival in those places in warm countries, where similar localities are the more active agents of disease. Analogous proofs are furnished throughout Europe, particularly in its southern provinces, and in North America, whenever long and warm summers have succeeded to heavy and continued rains; and diseases possessing more or less of the true characters of intertropical disorders have prevailed to an extent proportionate to the nature of the locality and the concurrent circumstances, and would have continued to prevail had not the approach of winter put an end to the generation of the causes producing them.

A most important circumstance, which goes far to account for the much

greater unhealthiness of moist and marshy situations in warm countries, is the quantity of animal matter, in a state of decomposition, which they present. The same circumstances which render vegetation quick and luxuriant, tend also to generate immense swarms of reptiles and insects; the exuviae and dead bodies of which, mingling with vegetable matter in a state of decay, and combining with moisture, give rise to miasms of a much more noxious description than those resulting from vegetable decomposition and moisture alone. In the course of our experience in warm climates, we always have considered the number of insects and reptiles with which a place abounds, as more indicative of its unhealthiness than any other circumstance; for in it there is a most powerful cause of disease in its worst forms superadded to those already in existence; and, as the one cause is extensive and powerful, so, generally, is the other. The great unhealthiness of low, moist, and marshy places in temperate climates, during warm seasons, particularly in the months of July, August, September, and October, is as much owing to the immense swarms of insects which then abound, and which die during these months. Italy furnishes numerous proofs of this; and every warm country in the globe will verify the axiom, that a place is unhealthy in proportion as it furnishes, with the various causes of disease depending upon locality and temperature, animal remains and animal substances in a state of decomposition, mingled with the products resulting from the decay of vegetable matter.

The copious extrication of unwholesome effluvia from salt marshes and partial inundations of the sea, has been long admitted, and has only been disputed by one writer of eminence, who instances, in disproof of the position, the salt marshes of one particular district in the western hemisphere. But there, it is probable, that there was some peculiarity in the soil and its productions, which rendered the formation of malaria impossible. The soil may have consisted of a deep bed of sand or gravel, but imperfectly covered by vegetation. Under such circumstances, unwholesome effluvia could scarcely be formed; for vegetable decay could neither be so rapid, nor the products from it be so copious, as to generate the principle which is so productive of mischief. The salt water, also, during its passage through the sandy stratum, would become mixed with fresh water only during the prevalence of rains,

and would be so filtered in its course as to be deprived of those animal products which are always so abundant in sea water, and which accelerate putrefaction when it is stagnant.

If, in opposition to the opinion thus brought forward (and which deserved notice only on account of the very high and deserved authority of the excellent physician who promulgated it), we inquire into the state of our experience of the matter, we shall find, that, in every instance where the soil is deep, of a rich, dark or clayey mould, or in any respects absorbent, and still more so if it be covered by a rich, rank, or succulent vegetation, and not admitting of a speedy drainage of the waters which may inundate it, insalubrious exhalations are copiously formed under the influence of a warm sun and a moist and stagnant state of the air; and that upon all occasions, when such soils have been inundated by the sea, as from the breaking down of embankments, &c., the formation of deleterious effluvia has become most abundant, under the favourable circumstances mentioned above, and has been even the source of a most devastating pestilence. In proof of this, we may mention the noxious situations and salt marshes at the mouths of the Ganges, the Irrawaddy, and the Indus, and numerous other places in the East. But, without having recourse to the proofs furnished us from within the tropics, we may adduce still more familiar instances. It is well known that the severest visitations of fever in Holland have taken place in warm summers following the casual inundations of the sea. The fever which prevailed so destructively in the north of Holland, during the summer and autumn of 1826, was a very strong proof of this.*

* The epidemic which prevailed in Holland, and particularly in Groningen and its vicinity, during the summer and autumn of 1826, seems to have been owing to the partial inundations of the country by the sea during the preceding winter and spring. Through Friesland, and particularly in the town of Sneek, observes M. Kirchoff, (*Journ. Complement. Jan. 1827,*) this cause appears to have had a decided influence. Sneek is a handsome and well-built town; the streets are broad: the population in 1825 was 6,373; and the deaths were from 10 to 12 monthly. In the autumn of 1826 it became the centre of the epidemic which ravaged Friesland; and in July the deaths were 23, in August 87, in September 80, in October 127, and from the 1st to the 20th of November, 62. The water in the fosses of this town is generally limpid and running; and that

The effects resulting from the inundations of the ocean are not, perhaps, referrible so much to the circumstance of a small quantity of salt proving a septic, as is supposed by many; for it seems evident that the antiseptic properties of salt are in proportion to its quantity, and that a small portion will not have a septic tendency, because a large one has an opposite effect. The subject has not received its deserved attention; and authors have, in respect to it, been more prone to copy the suppositions and admissions of their predecessors than to examine into the grounds upon which the opinion is founded. That sea water mixed with fresh water and vegetable matter in a state of decay, will increase the generation of effluvia, under the influence of a powerful sun, and render them more concentrated, seems to be the fact. It has been repeatedly presented to our notice, and is supported by the testimony of the majority of observers. But this result seems to be owing to the quantity of animal matter sea water contains, which occasions it to run faster into putrefaction than fresh water, when subjected to a warm temperature and kept at rest. Much is also owing to the lowness of the situations where inundations take place, and the quantity of vegetable and animal matter in a state of decay which such situations contain. The exhalations proceeding from these places, whether within the tropics or in temperate regions, during warm seasons, are generally more noxious during very moist

which usually fills the adjoining ponds and lakes is equally pure, and suited to domestic purposes. But, after the breaking down of the dykes in 1825, and the consequent inundation, the water became salt and brackish; and, during the high and continued heat of the following spring and summer, it became greenish, and so offensive, that workmen could not labour in the vicinity without being seized with intermittents and remittents. As the summer and autumn advanced, the fever assumed a remittent and even continued form, and the effluvia from the soil became more concentrated and noxious, as the waters were more completely drained off by the continued warmth of the season. At the same time, the bad water was used, without sufficient purification, for domestic purposes. These causes, although instanced here, with respect to this particular place, were also present in equal force at Groningen and other places in Friesland. The fever, which was at first intermittent, assumed a continued type; and, during the exacerbations, the pains of the back and head were increased. In the majority of cases the liver was much affected. In the months of August and September the fever assumed the characters usually presented by fevers in low and moist situations within the tropics; the circumstances occasioning them being in every respect similar.

states of the air—a condition always present in warm climates; and they are still more particularly hurtful when they have been collecting for a considerable time, owing to the continuation of calm weather, and the absence of thunder-storms, or those more violent atmospherical vicissitudes which are so beneficial in sweeping away the exhalations accumulated in low and narrow ravines, and among the thick underwood of intertropical regions.

The next great source of insalubrious exhalations, are dense and low jungles. Places covered by this species of vegetation are so numerous in all countries within the tropics, that it would be quite endless, as it is unnecessary, to enumerate them. Not only are low situations, but also the sides of hills, covered by this, of all the worst, species of vegetation. Its thickness, exuberance, and the succulency of the plants shooting between the dense brushwood and reeds, offer a constant supply of decayed parts as the unremitting vegetation proceeds, and prevent the sun from reaching the soil; consequently, the roots, the creeping and lower plants, and the decayed parts of all of them, and the exuviae of myriads of insects and reptiles, are immersed in a moist, rich, and absorbent soil, and a moist and stagnant atmosphere, which being seldom renewed, is thereby loaded with the accumulated exhalations given out from these productive sources. If, in addition to these circumstances, others also of powerful influence in the generation of unwholesome air be added, such as a low confined position between hills, &c., the formation of malaria must be necessarily still more accelerated. Places of this description are presented to us in every district in warm climates, and furnish us with numerous instances of their bad effects upon the human constitution, and upon the health of Europeans, particularly when they are not avoided, or when exposure to them takes place at improper seasons and under predisposing circumstances. Indeed, when the exact relations subsisting between the soil and the vegetation in situations now under consideration are examined into, they will be found nearly the same as those which marshes most usually present. In jungly places, also, there is seldom any complete range of large or majestic forest trees, which, in temperate climates, frequently skirt the margins of marshes and the low banks of rivers, and confine miasmata to the source whence they arise, and skreen the

adjoining neighbourhood from their effects. On the contrary, the more stately productions of the soil spring up but rarely, and at considerable intervals from each other, among the thick and low brushwood constituting the jungles of warm countries.

Nor are the more extensive forests unproductive of those exhalations which are the chief sources of intertropical diseases; for they frequently present nearly the same circumstances upon which the generation of miasmata depends; and whenever these circumstances are favourable, disease is the usual consequence. The quantity of the decayed leaves with which the soil abounds, its moist state, the moist, hot, and stagnant state of the air, particularly after the rains or monsoons, are the conditions upon which the generation of malaria by forests depends, and which are the frequent causes of fevers. Whilst, however, jungles more nearly approach to the condition of a marsh, and permit the transport of the exhalations to some distance from their source, unless circumscribed by skreens of tall trees, forests confine the exhalations they generate to their immediate limits, and seldom permit any to rise above the verdure of their highest branches, or to extend beyond their outskirts. Indeed, the free circulation of air in places on the confines of a wood, or even around the outskirts of the wood itself, renders such situations even healthy, in comparison to the interior of a dense forest. Much will, however, depend upon the locality, and upon the kind of trees forming a wood or forest. In warm climates forests are met with in a great variety of situations, — covering the sides of mountains and the tops of hills, as well as extending into the plains and valleys. It is chiefly in the latter places where woods become productive of malaria; for there the atmosphere is more frequently stagnant, particularly when they are protected from the full force of prevailing winds by intervening hills. In these latter places, also, the soil and air are much moister; and hence the ground intervening between the large trees, forming a wood or forest, is often covered by a rank and luxuriant vegetation; the decayed parts of which, with the leaves fallen from the forest trees, speedily generate in the moist soil very unwholesome emanations, which may be limited to the precincts of the wood wherein they were produced, or wafted to some distance, according to the circumstances of the situation, climate, and

season. Forests, also, in warm climates, are always, particularly in low and moist situations, in a state of vegetation, so that the soil is thereby more completely sheltered from the winds, and from the sun, and the air within them is more frequently sultry, moist, and stagnant, than is the case with the woods or forests of temperate or cold climates, where there is at one season in the year a complete denudation of the trees.

Another important circumstance which should be viewed in connexion with the noxious effects observed to proceed from the woods covering low situations, is the nature of the woods themselves and of the underwood. In temperate and cold climates they resist decay much longer, and contain more tannin and more of the terebinthinate principles; so that the emanations proceeding from these sources are less concentrated and less noxious in their effects. In every instance, therefore, much will depend upon the climate, and the nature of the locality and soil where woods or forests are met with; and much also may be imputed to the nature of the woods themselves, and the extent to which their trunks are surrounded by underwood.

When the familiar influence of wet and close woods and forests in the southern countries of Europe, in producing the usual effects of malaria, is considered, there will be less hesitation in allowing a similar influence to be present from the same causes within the tropics, and to a much greater extent — the circumstances productive of such influence existing there to a greater extent, and in a more manifest manner.

There is one important circumstance connected with this part of our subject, which cannot with propriety be here passed over. It has been supposed that, if it be granted that woods and forests in low, wet, and sheltered situations, are productive of endemic disease, such disease will disappear on the clearing of the soil. This, however, is not a correct inference, and cannot be supported either by *à priori* reasoning or by facts. We have already stated that the deep, moist, and absorbent soils of low and sheltered places, when covered by woods or forests, are less noxious to the surrounding neighbourhood, and less productive of miasmata, than they would

probably be if they were covered by grass or jungle: for, in the latter case, they would be more completely subjected to the action of the sun, and the malaria thereby generated would be more readily transported to places in the immediate vicinity, because it would not be arrested in its course by woods or tall trees, by which it is evidently attracted:—whilst, in the former, the woods and forests protect the soil and vegetable matters suffering decay in it, from the influence of the sun, and retain the emanations which are formed, as attentive observation has shown, although it has not explained the manner in which this is effected. When, however, a deep, moist, and rich soil, is deprived of that very rich and majestic covering which protected it from the influence of the sun, and at the same time guarded the inhabitants from the miasmata which were actually produced from it, and is exposed to the direct action of the sun, and to a hot and moist atmosphere, with the accumulated load of vegetable matter with which it had been enriched through ages, much more noxious effects are observed to follow, than when it remained in its former shaded condition. We have generally remarked, that when the ground was covered by a wood or forest, a weaker or less noxious emanation was apparently generated, for intermittents or remittents, and those of a mild character, were the only consequences; but when the action of the sun upon the rich moist soil was permitted, exhalations were formed of a more noxious description, and malignant remittents, continued fevers of a bad type, yellow fevers, and dysenteries, usurped the place of the milder forms of disease, which the same place, when differently circumstanced, had produced. Places of the kind now noticed were productive, it is true, annually, and at particular seasons more particularly, of agues; but when cleared and exposed to the influence of a powerful sun, they became the sources of the most malignant and most pestilential diseases; appearing, it must be admitted, at longer intervals, and requiring particular circumstances—as previous inundations, followed by long and great solar heat, moist and stagnant states of the air, the exposure of new portions of earth to the sun's rays, &c.—for their production.

In proof of the assertion which we have now made, we may adduce the observations of Dr. Rush, whose science and candour did honour to the profession and to his country. He observed, that the endemic disorders of

Pennsylvania were, by clearing the soil, converted into destructive epidemics; and that it was not until the soil had been subjected to cultivation for a long series of years, that a tolerable degree of healthiness was restored. Analagous facts have presented themselves to our own observation in various parts of the East, as will be more fully shewn in the sequel. Although a continued cultivation may restore the salubrity of a place which had been diminished by clearing the soil, in low situations, of the woods and forests which covered it, and by exposing its wet and luxuriant surface to the action of the sun, in temperate and northern climates, it is by no means so clear that the same industry will be followed by so happy an effect within the tropics. The West India Islands furnish proofs even of the contrary: for it is allowed, that upon their discovery, and for many years afterwards, they were less productive of disorder than at the present day, and diseases were then of a less malignant character. It must, however, be admitted that various circumstances, occurring either singly or concomitantly, but generally the latter, are required to produce those more malignant forms of disorder; hence they supervene at longer intervals, and with greater irregularity, than the slighter disorders resulting from the previous conditions of the soil. The history of the West Indies, of the southern states of North America, of the epidemics of New York and Philadelphia, of many places on the coast of Africa and South America, particularly the coast of Guinea, in the former, and Guiana, in the latter; and even the precise information furnished us respecting various places in the southern countries of Europe, confirm the view we have now taken. The district of Bresse, in the Lyonnais, illustrates this in a very pointed manner. When well wooded, it was comparatively healthy; but now deprived of its woods, it is always subject to endemics and epidemics. In this district the clearing the low and wet soil has exposed it more to the action of the sun, while the exhalations from its numerous marshes and stagnant pools are no longer confined by surrounding woods and forest trees. Similar examples may be adduced from Monfalcon,* Devèze,† Bailly,‡ and others.

* *J. B. Monfalcon.* Histoire Médicale des Marais, &c. 8vo. Paris, 1824.

† *J. Devèze.* Traité de la Fièvre Jaune. 8vo. Paris, 1820.

‡ *E. M. Bailly.* Traité Anatomico-Pathologique des Fièvres Intermittentes, &c. 8vo. 1825.

It was long since remarked by Pliny and some other writers of antiquity, that trees absorb the exhalations from the soil which prove injurious to the human species. Whether the influence of trees in diminishing the bad effects resulting from terrestrial exhalations proceeds from their simply obstructing the passage of the miasms existing in the lowest strata of the atmosphere, or from their actually absorbing the miasms themselves, along with the moisture and dew, which rests upon their leaves, and with which marsh miasmata seem to be intimately connected, or from shading the soil from the action of the sun, thereby preventing the generation of a luxuriant vegetation, as well as the extrication of noxious exhalations, the power they possess in low, wet, and marshy situations, of moderating and confining the generation of malaria is indisputable; and, therefore, where lagoons, marshes, low places subject to inundations, either from the overflowing of rivers or from irruptions of the sea, cannot be drained or preserved from these occurrences, the planting of the more majestic forest trees in such a manner as shall best protect the vicinity from the exhalations which are formed, becomes a matter of the most serious import to the community.

Of all the places productive of disease in warm countries, there are none more deserving of notice than rice grounds. They are always undergoing alternate inundations and cultivation; and are generally situated, with respect to rivers and high grounds, so that the mud and filth carried down by the former are deposited on their surface upon the subsidence of the water, while the latter protects them from the perflations of the prevailing winds. The white inhabitants of districts surrounded by, or abounding with, rice fields, are generally the most sickly and the weakest of this variety of the species; and strangers, remaining for any time in their vicinity, are generally soon attacked by the diseases proper to such places. The inhabitants of countries in the south of Europe, and the white residents and natives of the southerly parts of North America, where, owing to the situation and circumstances of the soil and climate, rice is extensively cultivated, seldom possess the healthy appearance of their species, even at any period of their short lives, and seldom live longer than the time which is required to bring the native of a healthier climate to maturity. It seems to us wisely ordered, that countries

which contain, owing to their situation, soil, and climate, the seeds of certain diseases to which Europeans become invariably subject when they migrate thither, should be peopled by a particular and an appropriate race, of a different constitution and character, and calculated to pass their existence in such situations without having their lives materially shortened, or being more frequently subject to disease, than the natives of cold or temperate countries. This adaptation of the different varieties of our species to the nature of the country they inhabit, and the consequences arising from migrating to places where the relation between the climate and the particular variety of our species no longer holds, affords some of the most interesting, and they are the most philosophical, topics for the consideration of the medical inquirer.

The grain coast of Guinea, which furnishes the most perfect form of the negro, is the most insalubrious climate with which Europeans are acquainted. Subject to inundations during the rainy seasons, and no where almost rising more than a few feet above the level of the sea, covered by a dense under-wood and luxuriant vegetation in some places, abounding in lagoons, marshes, and jungles in other places, and admitting only of a rice cultivation, an European scarcely ever passed a night on its shores, without becoming the subject of disease; and yet, in this wide district of country, the most unfavourable in the whole globe to European life, and indeed to all the higher animals, particularly those which have been domesticated with man, or have been reared for his sustenance — where neither the horse, nor the dog, nor the bullock, nor the sheep, is scarcely ever seen — the negro variety of our species exists in its greatest perfection, presents the most perfect symmetry, lives to a good old age, and is seldom the subject of disease. If we look closely into the conditions and characters presented by a district or country, and view it in relation to the constitution of its inhabitants, we shall observe a very intimate connexion existing between the one and the other, in whatever quarter, district, or kingdom of the globe we may direct our inquiries.

It is notorious to every traveller who has visited the south of Europe, and has even, in the slightest manner, turned his attention to the state of the inhabitants cultivating the rice grounds, that they are the subjects of the

worst form of endemic disorders, and of visceral obstructions. The same fate also awaits the white population of the more southerly states of North America; whilst the black cultivators are exempt. The extent of disease proceeding from the cultivation of rice in Italy, Sicily, and Greece, has been sufficiently shewn by Bailly, Targioni, Grottanelli, and others. Indeed, there cannot be a doubt as to the effects which the circumstances connected with this species of husbandry produce upon the constitution of the white variety of our species. The exposure to the influence of a powerful sun, of a rich, wet, and low soil, which has undergone repeated inundations and irrigation, and which abounds with vegetable matter in a state of decay, are the conditions upon which the formation of malaria in rice grounds seems to depend; and it matters but little whether these conditions result from the cultivation of rice, or from the natural circumstances of the soil and climate, so be that they actually exist. Throughout India, Ceylon, Java, and almost all the countries of the East, where the nature of the locality admits only of a rice and indigo cultivation, Europeans are continually the subjects of disease to a greater or less extent; and although the Hindoo and Malay population are less liable to be affected, owing to that adaptation of constitution to the soil and its productions, as already noticed, yet they are occasionally slightly influenced by the same causes. It may be true that those places, particularly within the tropics, which are subjected to the cultivation of rice, would, owing to the nature of the circumstances generally characterising them, be still productive of malaria, if left to nature, although not to the same extent. But as this is the only, or at least the chief, species of grain they are capable of yielding, if thus left to the dominion of nature, whole districts would soon become depopulated. This kind of cultivation, however, brings the inhabitants more within the sphere in which the endemic causes of disease operate; so that if a white population were employed in it, within the tropics, it would soon altogether disappear before them. The habit of body and constitution of the natives render this, and all other forms of cultivation suited to warm climates, comparatively innoxious to them, unless during certain seasons and epidemic conditions of the air which occasionally occur, and with which the medical history of hot countries makes us acquainted. With respect to the diseases which result from terrestrial emanations, and

the extent to which these causes are operative in their production, and to which they require the concomitant or consecutive action of other causes, we shall have to inquire into these matters hereafter.

Rice grounds, it should further be remarked, which are almost constantly subject to inundation, or always covered by water, as they are in some parts of India and the East, as Trichinopoly, Tanjore, &c., are much less productive of disease than those which, after inundations, are exposed to the action of a powerful sun. It is to this latter circumstance that the comparatively greater unhealthiness of rice grounds in the south of Europe may be imputed: and in the East, the sickly state of Seringapatam, &c. is chiefly to be attributed to this cause.

The margins also of shallow lakes are every where productive of disease when the temperature of the air is high. We have numerous instances of this in our own country; and we need go no farther for its illustration than Whittlesea Mere. Lakes and pools with shallow margins and low banks are generally productive of disease, in proportion as they are low, and as the climate in which they are situated is warm. The specific conditions on which their unhealthiness depends must be evident from what has been already advanced; and in proportion as those are present in any particular case, so will the production of marsh miasmata and disease be more or less abundant.

Canals may be adduced as another source of disease, particularly when they are neglected, or are filled by foul and stagnant water. Canals are not frequently met with in tropical countries, excepting China, where they are generally kept in good order. At Batavia, however, where they are numerous, and intersect even the town itself, they are amongst the most influential causes of disease. Containing putrid and stagnant water, holding the remains of animal and vegetable matter in a state of decay, with the bodies of dead animals floating in them, and constantly imparting to the air the most noxious miasms, Europeans who come near them, if predisposed to their noxious influence, soon become the subjects of disease. This was

sufficiently evinced during the British expedition to Java, and whilst the city of Batavia remained in our possession.

Next to canals, in the production of malaria, may be enumerated ditches surrounding fortified towns or cities. There can be no doubt that the ditches surrounding towns, either when they become foul, or when they are dried by great or continued heat, become the source of a similar exhalation to that which is given out by marshes, and are often the cause of disease to the inhabitants, for whose protection they were made. And it is more than probable that the fevers and dysenteries which have been so often noticed as having weakened both the besieged and the besiegers, have been more owing to this circumstance, heightened, it is true, by hot, moist, and stagnant states of the air, and by the other powerful causes to which a besieged population and a besieging army are exposed, than to those causes to which they have been more generally imputed. Ditches of whatever description, whether used for the protection of towns or of camps, or for draining the soil, are necessarily productive of malaria, particularly when they are partially dried up, or soon after the mud and vegetable and animal exuviae they contained have been thrown from their bottoms upon their sides, and exposed to the action of the sun.

The same efficient circumstances which point out ditches as productive of terrestrial exhalations, are also present with respect to many of the tanks which are made in India, particularly in the provinces of Bengal. In many places, owing to the superstition and ostentation of rich natives, more tanks are formed than are kept in good order; and those which are neglected assume an appearance, in many respects, similar to ditches or stagnant pools.

The influence of pools in the production of disease must be evident from what has been already advanced. Their agency and effects have been most satisfactorily illustrated, in conjunction with those of canals and ditches, by Monfalcon, Bailly, and others; and the characters of those diseases which have been observed to abound in many places in the south of Europe, where they are met with during warm seasons, have been well described by these

writers, and are, in most respects, evidently the same diseases which the practitioner has to encounter within the tropics.

The exposure of new earth, particularly if it be rich, wet, and abounding with vegetable and animal remains, to the influence of a powerful sun, has been already shewn to be, upon clearing the soil, and on its first cultivation, productive of disease. But rich, dark, and absorbent earth, which is usually always exposed during the dry season, is also a very fruitful source, particularly if it lay low. Of this, numerous instances occurring within the tropics are on record; and others may be adduced from temperate countries. At Kurnoul, on the banks of the Toombudra river, the soil consists of a wet, rich, and adhesive dark earth, of great depth, and which, when exposed after the rains to a powerful sun, exhales a very copious moisture, and opens into deep chasms. Owing to this condition chiefly, — for nothing else can account for the circumstance, — disease was most prevalent amongst the troops in this station, and the mortality considerable. The banks of the river are clean and shingly, and there are no marshes, nor jungles, nor woods of a description calculated to account for the extent of the endemic diseases which were encountered in this place.

Similar instances to the above might be enumerated, if our limits would permit. We cannot, however, leave this particular part of our subject, without insisting upon the fact, which our own observation has fully convinced us of, and in support of which numerous examples may be adduced from the most accredited observers, that exhalations neither are formed so abundantly, nor are so noxious, from pools or marshes, whilst partially covered by water, as they are when the earth and mud at their bottoms, owing to the evaporation of their waters, are fully exposed, with the vegetable and animal substances they contain, to the influence of a powerful sun. The conditions of the earth thus made bare, after a long emersion, are nearly those of newly exposed earth, soon after it has been deprived of its woods and subjected to cultivation. Of the influence of low, moist, and rich soils in producing the worst forms of fevers, when broken up and exposed to the sun, after having long been covered by woods and forests, or by water, or by an abundant and rich

vegetation, we have sufficient proof, both from our own observations, and from the evidence furnished by writers upon the diseases of the West Indies and America. Volney and Rush have adduced numerous instances in support of this position; and many more are to be found in the writings of the best modern physicians, particularly of those countries where endemic diseases are prevalent.

Having thus pointed out the places and conditions of soil most productive of miasmata, we shall conclude this particular part of our subject with noticing those particular states of the air which seem to promote the generation and accumulation of them. It should, in the first place, be kept in recollection, that the result of observations, made in various parts of the globe, and particularly within the tropics, proves that the various soils and places which have been described as most productive of malaria have been considered as generating it, more especially under particular conditions as regards dryness or moisture. Places which are usually the sources of noxious effluvia do not generate them, when completely inundated. Many unhealthy districts within the tropics are most tolerable to European constitutions, whilst they are completely covered by water, so as to leave no part of their surface exposed to the sun's rays. But as soon as these, as well as all other places capable of producing malaria, are made bare, so that the air and the sun's rays have sufficient access to them, then the formation of effluvia proceeds, and increases in proportion as the exposure becomes more or less complete, until the moisture of the soil, together with the products of vegetable and animal decay contained in it, are completely given out; and places which have thus exhausted their exhalations during their exposure to the influence of the sun and atmosphere, may speedily have them renewed upon the accession of that supply of moisture which is requisite to their generation. Thus, any low, rich, and swampy district within the tropics, which is inundated during the rains or monsoons, and dried up in the hot season, shall, during the time that it is completely under water, be found to be perfectly healthy as respects the European constitution: but as soon as any of its surface becomes exposed after the rains, then agues appear; and when its whole superficies is acted upon, then fevers of a more severe and dangerous type make their appearance.

After the moisture and the products of vegetable and animal decay have been completely exhaled, the diseases proceeding from this source disappear, until a fall of rain again furnishes one of the requisites to the production of terrestrial exhalation: hence it is that disease often appears upon the commencement of the rains in warm climates. Places which have been completely inundated during the rains or monsoons, or which have been in a marshy state during the dry season, are generally rent into deep and wide fissures, which allow the air and the rays of the sun, and the consequent heat, to reach to a great depth; and thus exhalations are generated and poured out from the lowest strata of the soil through these fissures, and they become more copious and more noxious, the greater the heat and the longer the drought, and the deeper and wider the fissures which are thus formed in the earth.

In warm climates, all the conditions of the soil which have been enumerated as productive of the efficient causes of disease exist in the extreme. The ultimate, as well as the proximate, constituents of the plants, growing from a soil within the tropics circumstanced as we have described, and their rich and succulent nature, are such as favour their rapid decay, and promote the generation of immense swarms of insects and reptiles; and the products formed by the decomposition of both the vegetable and animal bodies, which an intertropical country so very abundantly yields, are more concentrated, because more rapidly and more copiously formed, and are consequently more deleterious, as respects their impression upon the human frame, than those of temperate and cold climates. In proportion as the temperature of the air is higher, and as its humidity is greater, and as the soil is more rich and moist, and more loaded with the remains of organised substances, and as its surface abounds more with vegetable and animal productions, will the quantity of miasmata proceeding from these sources, and floating in the atmosphere, be great,

One of the chief effects of a high temperature is to hasten the decomposition of organised bodies: another is to raise the capacity of the air for humidity. The atmosphere of an intertropical country, at particular seasons especially, is uncommonly moist. This is more remarkably evident in insular situations, and in places on the sea-coast, immediately before and after the rains, and during

still states of the atmosphere. This humidity of the air, particularly if combined, as it usually is, with great warmth, and occasionally with an almost stagnant state, acts upon localities similar to those which have been noticed, in a double capacity, favouring at once a most abundant vegetation, and hastening decay as soon as the vegetable vitality departs. The moisture, also, which exists in a warm atmosphere, holds in solution that principle or effluvium which is formed from the soil, and which, contaminating the air, produces endemic and epidemic diseases. That such is the case, is shewn by the prevalence of those disorders which proceed from this source during still and moist states of the weather, particularly in warm climates, and by their total disappearance before dry winds. It has been frequently remarked on the west coast of Africa, where the endemic causes of disease now under consideration are most abundant, that if the Harmattan wind, which is most remarkably dry, follow a still and moist state of the air, all the diseases proceeding from the terrestrial emanations accumulated in consequence of this state of the weather rapidly disappear; and similar occurrences, of a less remarkable kind, occasionally supervene in all warm countries. Moist states of the atmosphere act, therefore, in accelerating vegetation, and promoting the generation of insects, in hastening vegetable and animal decomposition, and in concentrating and combining with the miasms generated from this and other sources. The moisture of the air seems to dissolve or combine with marshy and terrestrial exhalations, inasmuch as the latter become much more manifest in their effects during the existence of the former; whilst these effects soon entirely disappear before a dry state of the atmosphere. The influence of the Harmattan wind has already been adduced in proof of this; but other causes, as well as the condition of the air as regards its humidity, are concerned in these effects. Humidity will not so readily be productive of mischief, if there exist a free current and circulation of air, because time is not allowed for the accumulation of the effluvia within circumscribed limits. But when the atmosphere is perfectly still, in conjunction with great humidity, it soon becomes loaded with those exhalations to which it thus offers so great an affinity. Hence the danger of approaching the sources of malaria during still states of a humid and warm atmosphere, particularly at the close or dawn of the day, when the exhalations are condensed, or unrarified by the solar heat, and when the system

is more open to their noxious impression. During moist states also of a warm atmosphere, the equilibrium of its electrical conditions is disturbed, as well as that of the whole body, and the changes effected upon the blood in the lungs during the function of respiration, is somewhat impeded. The good effects of a free and quick renewal of the atmosphere in unhealthy places; of a thorough ventilation; of high winds; of tornadoes, hurricanes, and thunder-storms, in dispersing and altogether sweeping off the exhalations and effluvia proceeding from the exuviae and decay of animal and vegetable substances, must be sufficiently apparent from what has been adduced. The dry winds and the thunder-storms, so frequently occurring within the tropics, are the means which Nature resorts to in order to dilute or entirely dissipate the exhalations proceeding from, and accumulating in, the places similar to those noticed: and if these more violent commotions of the atmosphere were not to supervene frequently, very many districts of country would be rendered uninhabitable both by man and by many of the higher animals. Indeed, it has been often observed, that when the air has continued long undisturbed by winds or thunder-storms, and have been long hot and moist, disease assumes a pestilential character. Of this fact medical histories furnish numerous examples. The very remarkable epidemic fever which ravaged the West Indies and the coast of America was ushered in and accompanied, according to the testimony of Rush, Chisholm, Clark, Devèze, and others, by long continued droughts, a still and humid state of the air, and a most unusual absence of thunder-storms and hurricanes. Various other instances might be adduced of a similar relation existing between the states of the air and the prevailing diseases, both within and without the tropics. Indeed, every practitioner who has enjoyed any experience in warm climates, has had numerous opportunities of observing the manner in which the character of the prevailing diseases, and their propagation, have been influenced by the prevalence or absence of thunder-storms and tornadoes. It would even seem that the frequency of these commotions of the atmosphere, as well as their violence, have a very intimate relation to the unhealthiness of a country. Our own experience has long convinced us that this relation actually subsists; and that it should exist as a general result, is not to be wondered at, since the same conditions and circumstances on which the unhealthiness of a climate

depends are also those which give rise to thunder-storms and hurricanes, and which render their frequent occurrence necessary to the health of those by whom the country is inhabited. The western coast of Africa could not be endured, even for a season, by the European inhabitant, and perhaps scarcely long by its natives, did not the Harmattan wind occasionally blow, and tornadoes of most surprising violence occur frequently during the most unhealthy seasons of the year. A similar remark may be made respecting the hurricanes of the West Indies, and the tornadoes and storms which frequently blow in the East. The dense, moist, hazy, and close atmosphere, loaded with the exhalations of putrid insects and reptiles, and of the soil and its vegetable productions, after remaining for a time still and suffocating, enervating those who are destined to breathe it, and infecting their circulating fluids, suddenly becomes kindled into the most vivid commotion—sweeping before it whatever opposes its progress, and blazing out in one ocean of flame, which seems momentarily extinguished by the torrents of rain which rush furiously to the earth, and is immediately again lighted up to its greatest brilliancy and widest extent; so that the atmosphere presents the most extensive and the most sublime conflict between fire and water which the imagination can paint, whilst the irresistible force of the winds seem to sweep both combatants from the field.

The general result of these frightful commotions is to destroy those exhalations which have accumulated in the depths of forests and ravines, and in the bottom of valleys, to purify the air, and to refresh the entire offspring of nature. Their beneficial effects cannot fail of being recognised by the observing practitioner, whilst the unwholesome tendency of that climate or season on which their frequency depends, becomes equally apparent to his notice. But the circumstances which give rise to them would be productive of greater mischief if they did not supervene; and therefore their occurrence is to be looked upon as a benefit, or at least as a lesser evil, calculated to counteract a much greater one, which would inevitably occur if the other did not prevent it.

Besides the influence of humidity in the generation and accumulation of malaria, the operation of the electrical fluids should be taken into account.

But to what extent, or in what manner these fluids act, we have no precise knowledge. That they have some action, however, is most probable, inasmuch as their active agency in the animal economy is evident, and as unhealthy states of the air have been observed to have been related to derangements in the electrical conditions, or in the equilibrium of the electric fluids. It is also most probable that the electricity proceeding from the earth at particular parts may so influence the condition and extrication of the gases and the effluvia which the soil yields in those places, and may so combine with them, as to form the efficient principle or cause of disease. Of this, however, we have no positive knowledge; but the review of various states of the air and of the seasons, in connexion with the circumstances of the soil, which have been noticed as productive of disease, and both considered in relation to what information has been furnished respecting the electrical conditions at the time, seem to point out some connexion beyond mere coincidence: but in what that connexion consists, or whether it is to be considered as one of cause and effect, we cannot take upon ourselves to decide. Much requires to be observed with respect to this important subject, particularly within the tropics; and much of the credit which is to be placed in observations respecting it will depend upon the talent and acquirements of the observer, and upon the means of observation which he shall employ.

SUB-SECTION II.

Remarks on the Nature, Properties, and Effects of Miasmata, and on the Manner in which they invade the System.

THE intrinsic nature of that matter usually denominated marsh miasm and malaria, and which has so powerful an effect upon the human constitution,

that more than two-thirds of those who die in warm climates are cut off by its influence, has never been satisfactorily shewn, although repeated attempts have been made to ascertain it. Dr. W. Currie supposed that marshy exhalations consist of hydrogen and ammoniacal gases, and that the unhealthiness of low and marshy places arises from a deficiency of oxygen gas in the atmosphere; but eudiometric experiments have proved that the air over those situations contains its due proportion of oxygen, and that it is unwholesome owing to the presence of some foreign substance. Subsequent experiments, performed by Gattoni, Moscati, Brocchi, and Julia, have shewn that marshy soils give out carburetted hydrogen; but their effects cannot be imputed to this gas, as it has been found incapable of producing them. From the numerous experiments which have been made on the continent, in order to ascertain this point, it must be inferred, that we have no knowledge of the intrinsic nature of the substance which, vitiating the air in the vicinity of places which have been described, produces most baneful effects upon the human constitution. But a careful comparison of the effects which it produces, and a review of its phenomena, and of the laws which it seems to observe, lead us to offer the following remarks as deserving of confidence.

The sum of our knowledge, therefore, of the nature of this poison seems to be, that it proceeds from those elements which exist in a rich soil and nourish the vegetable and animal kingdoms. That these elements, when subjected to the action of the sun, together with the influence of the air and moisture, form new combinations, which are volatilised by the sun's heat, and readily combine with the moisture present in the lower strata of the atmosphere. This conclusion seems to be supported by the physical and medical history of terrestrial exhalations, as far as they have been investigated, either physically or medically. That they combine with aqueous vapours either during the period of their formation, or when they rise into the atmosphere, is proved by various circumstances. Whilst the vapours exhaled by the heat of the sun, and carrying with them the miasms given out by the soil, are kept in a state of rarefaction by the sun's influence, and conveyed to the higher regions of the atmosphere, then the usual effects of these miasms are not

produced. But as soon as the heat diminishes so far as to permit the vapours to descend and to become condensed towards the earth's surface, then the effects resulting from terrestrial effluvia become manifest. In the former case the effluvia are rarefied, along with the aqueous vapour, so that they are incapable of making a hurtful impression on the system when received into the lungs: in the latter case they are condensed with the vapour, and precipitated to the lowest stratum of the atmosphere, and are inhaled into the body in a larger quantity, and sufficient, in many instances, to produce effects according to the circumstances of the individual. Hence it is that the evening and night dews are much more to be feared in all districts and countries subject to terrestrial effluvia than any other period. This precipitation of the aqueous vapour and malaria forming mists and dews, particularly in low situations, is especially to be dreaded during still or stagnant states of the atmosphere. Within the tropics the earth retains its heat, after the sun has gone down, longer than the air. This circumstance tends to the accumulation of effluvia upon the surface; for, as their extrication from the soil proceeds to a considerable extent after the sun has gone down, they are no longer rarefied into the higher regions of the atmosphere, but are mixed with the dews and vapours descending at the same time; so that the sources whence exhalations are formed, being generally the lowest, are also the reservoirs wherein they accumulate. In warm climates their accumulation is in some degree prevented during the land winds which blow through the night. But these winds are frequently too light to sweep away the exhalations, which are collected in ravines and sheltered valleys; and when they are sufficiently strong for the purpose, they only serve to convey them to other places. It is chiefly during the calms which precede and follow the night winds that the accumulation of effluvia in low places takes place; and as these calms, with their attendant vapours, are usually about sunset and sunrise, exposure at those times should be avoided.

Malaria has been considered, in addition to its possessing the property of combining with aqueous vapour, as being specifically heavier than atmospheric air; and its presence and accumulation near the surface of the soil which produced it, has been attributed as much to this property as to its combination with moisture. Of this, however, we have no direct proof, although the

circumstance in question seems very probable from the following facts. It is well known to the inhabitants of Italy, and to all who have travelled in that country, or who have been any time within the tropics, that elevation above the sources whence malaria proceeds furnishes exemption from its influence, and that the exemption is in proportion to the height of the elevation. In many districts of Italy and Greece the villages are built upon elevated rocks, or hills rising abruptly above the surrounding low grounds, in order to avoid the miasmata which they generate. Sezza, which is beyond the reach of malaria, is about three hundred yards above the Pontine Marshes; and Tivoli, which is elevated about a hundred yards above Rome, is much healthier than this city. According to Humboldt, Encero, situated above Vera Cruz, is not affected by the diseases which render this port and its adjoining coast so much dreaded. This writer states that 920 yards, the elevation of Encero above the sea, is the highest limit of the yellow fever, the product of the most concentrated state of malaria. Dr. Hunter has stated that even the elevation of one floor is sufficient to afford a very great exemption from the diseases arising from terrestrial exhalations. He found that the number of cases of fever occurring on the ground floor of the barracks near Kingston, Jamaica, were, in relation to those affected in the first floor, as three to one. Similar facts have come under our own observations in various parts of the East, as at Seringapatam; but as some of them will be referred to in the sequel, we shall not detain the reader longer than is requisite to establish the fact. Whether the circumstances now noticed are to be explained by the affinity which the effluvium has to aqueous vapour, or by allowing it to possess a great specific weight, does not materially influence the facts which have been adduced, nor the much greater number more which might have been mentioned; nor are the inferences which may be drawn from them materially affected by adopting either opinion. Dr. Ferguson,* in the very

* This writer mentions the following fact, which we shall quote as illustrating this part of our subject, and as confirming our own observations in the East. "The autumn," he observes, with respect to the Island of Antigua, of 1816, "became very sickly, and yellow fever broke out in all its low marshy quarters, while the milder remittent pervaded the island generally. The British garrison of English Harbour soon felt the influence of that most unwholesome place. They were

interesting observations he has made upon this subject, has supported a third opinion, different from the two now referred to. He supposes that the marsh effluvium has a strong attraction to the surface of the earth, which tends to keep it near the situation whence it proceeds. But although places are generally more exposed to the effects of malaria in proportion to their lowness, as is well shewn by the village of St. Felice, which is 115 yards above the Pontine Marshes, and the environs of Terracina, which is only 40, yet the prevalence of certain winds, and other circumstances, occasion many exceptions to this as a general inference.

It would be interesting to ascertain the greatest height at which marsh exhalations produce their effects. But our own observations, as well as those recorded by other writers, have furnished results so different, as to lead us to conclude, that the elevation from its source at which malaria may arrive, so as to be productive of disease, will depend upon the general temperature of

distributed on a range of fortified hills that surround the dock-yard. The principal of these, Monk's Hill, at the bottom of the bay, rises perpendicularly above the marshes to the height of 600 feet. The other garrisoned hill, which goes by the name of the Ridge, is about 100 feet lower; but, instead of rising perpendicularly, it slopes backwards from the swamps of English Harbour. It was the duty of the white troops, in both these ports, to take the guards and duties of the dock-yard amongst the marshes below, and so pestiferous was their atmosphere, that it often occurred to a well-seasoned soldier, mounting night-guard in perfect health, to be seized with furious delirium while standing sentry; and when carried to his barracks, on Monk's Hill, to expire in all the horrors of the black vomit, within less than thirty hours from the first attack: but during all this, not a single case of yellow fever, nor fever of any kind, occurred to the inhabitants of Monk's Hill; that is to say, the garrison-staff, the superior officers, the women, the drummers, &c., and all, in fact, that were not obliged to *sleep* out of the garrison, or take the duties below, remained in perfect health. The result on the Ridge was not quite the same, but it was equally curious and instructive. The artillery soldiers (seventeen in number) never took any of the night-guards, but they occupied a barrack about 300 feet above the marshes, not perpendicularly above them, like Monk's, but a little retired. Not a case of yellow fever or black vomit occurred amongst them; but every man, without a single exemption, suffered an attack of the ordinary remittent, of which one of them died; and at the barrack, on the top of the Ridge, at the height of 500 feet, and still farther retired from the marshes, there was scarcely any fever worthy of notice."

the climate and of particular seasons, and upon the humidity of the atmosphere, and the prevalence and force of certain winds, and very materially upon the quantity of malaria which any particular part yields.

It should, however, be mentioned, as an exception to the position which the preceding facts seem to prove, that there are circumstances which render some elevated situations even more unwholesome than places near the margins of marshes. This is owing to the attraction which fogs and vapours have, as they rise from low valleys and marshes, to the ridges and sides of hills which overhang them. This is shewn by the heights which rise out of the marshes at Port d'Espagne, in Trinidad. Similar instances are afforded by the island of Dominica, Jamaica, &c. in the West Indies, and by several places in the East. Other situations, also, both considerably elevated above and retired from the sources of malaria, are affected by it to a very great extent ; but this is entirely owing to the prevailing winds passing over them, particularly those which blow during the night, without having been broken in their course by any abrupt ascent or ridge of rocks, and without having been deprived of their malaria by passing over woods or forests, by the foliage of which it is evidently attracted.

We have already noticed the fact, that malaria seems to be attracted by screens of trees, which often serve as one of the most efficient means of circumscribing limits to the baneful effects of this agent, when its source cannot be destroyed, and that this fact was turned to advantage in former times. It should also be known, that this noxious exhalation seems to be absorbed in its passage over water. This has been proved in numerous instances. Places situated on the healthy and dry banks of lakes or large rivers have experienced but little inconvenience from the marshes bordering their opposite banks, whilst districts much further removed by land from these sources of disease suffered from their vicinity. Nor was this marked difference in the effects owing to the prevailing winds ; for whatever advantage this circumstance was capable of producing, was in favour of the latter place, and against the former. That malaria, or marsh-miasm, is actually absorbed during its passage over water, is further proved by the exemption of crews of ships anchored on

coasts abounding with this poison, and lying in rivers sufficiently wide to allow them some distance from their marshy banks. This, viewed in connexion with another circumstance which should be recollected in our examination into the phenomena which this agent of disease evinces, and which will come under immediate consideration, furnishes some useful hints for those who may have, as all practitioners in warm climates will have, opportunities of turning their knowledge of this part of our subject to a practical advantage.

With respect to distance from its source, at which the marsh-poison affects the human constitution, no precise opinion can be formed: but there seems no reason to doubt that it is much diluted, or weakened in its effects, according to the distance to which it is transported. Thus it has been frequently demonstrated, that fevers have been continued or remittent, of the worst type, in low situations and near the sources of malaria, whilst in places removed from, or elevated above, these sources, fevers were either of a mild remittent or intermittent form, the disease being of a milder grade in exact proportion to the distance and elevation of the place from the source of malaria. Instances in proof of this position are recorded by Sir John Pringle and many other writers, and are of frequent occurrence, during the summer and autumn, in Holland, in Hungary, and in Italy. In the East and West Indies, proofs of this may be daily obtained, and they have constantly come before us, during a long and diversified practice in the Eastern hemisphere: and although numerous examples are on record, we shall only refer the reader to the instance quoted in the preceding note from Dr. Ferguson's interesting Essay.

As our experience has convinced us, (and we believe the experience of almost every observer has furnished a similar result), that the severity of endemic and epidemic disease is chiefly owing to the concentration and activity of the cause which produces it, relatively to the predisposition, strength, and particular circumstances proper to the patient; so we conceive, that, in a general average, the severity of the disease affecting many individuals may be considered as an index to the concentration or intensity of the causes inducing it; and hence, that the mildness of a disease occurring amongst great numbers

of men similarly circumstanced, will indicate a dilution or weakness of the cause whence it springs. From these results, therefore, it is chiefly to be inferred, that the malaria is diluted or weakened as it becomes diffused in the atmosphere, or transported from its source; and that it is so weakened in proportion as the dilution is promoted by the vertical currents induced in the air by means of the sun's rays, the dilution becoming still greater as its admixture in the air is farther facilitated by free ventilation, until its bad effects entirely disappear. It must be evident that this general result—the distance to which malaria may be transported from its source, and yet be productive of disease—will vary much, according to the vicissitudes of temperature, the general character of the season, the prevalence of certain winds, and the absence of others, and most materially as the quantity of vapour existing in the atmosphere may change, the source of malaria be more or less productive, and the obstacles in its course more or less easy to be surmounted. As a general inference, however, it may be mentioned, that malaria cannot be productive of severe disease at a considerable distance from its source.

It has already been stated that malaria is much obstructed, and in many instances almost entirely intercepted in its passage over woods, closely planted rows of trees, or forests, owing to its being attracted by their foliage; or over rivers, lakes, and inlets of the sea, by its being absorbed by them as it is wafted on their surface. The suburbs and the walls of a city or town also serve to intercept this poison in its passage from its source, as is well known to the physicians in Italy, and to those who have had sufficient experience in a warm climate. Even the buildings of one end of a narrow or crooked street have been known frequently to prove the means of exemption to those of its other extremity from the effects of this substance, owing to their intercepting it, as it were, whilst it is being conveyed by the night winds from adjoining swamps or rice fields. Numerous examples of this fact are on record in the works on malaria which have been already referred to, and similar instances have frequently come under the observation of those who have enjoyed opportunities of experience within the tropics, or even in the south of Europe. The West India Islands, and many places in the East, particularly Batavia, Seringapatam, &c. furnish numerous examples of the fact.

There is even good reason to suppose that the straightening and widening of streets, in towns or cities exposed to the influence of malaria, either from swamps in their vicinity, or from the nature of the soil on which they are built, are unfavourable to the health of their inhabitants: for by these measures, the winds which blow over the adjoining sources of malaria, and become saturated with this poison, have a more ready access to all quarters of a city; and the open streets allow the sun to act upon the soil on which they are built, which, if not well protected by a good pavement, and by drains and sewers, will thereby generate exhalations, which, added to those transported from sources in the vicinity, will materially injure the health of the inhabitants. That this effect was actually known to the ancients, seems apparent from the remark of Tacitus* on the rebuilding of Rome after its destruction by Nero.

SUB-SECTION III.

Of the Effects of Malaria upon the Human Constitution, and of its Mode of Operation.

HAVING noticed certain facts relative to the properties of malaria, and the circumstances which promote or arrest the diffusion of this active agent of disease, we shall next offer a few remarks upon the effects they produce upon the constitution, and upon their *modus operandi*.

The effects of malaria upon the human constitution may be considered to be in proportion to the quantity given out by the soil, to its concentration, to the

* Ex eâ utilitate acceptâ, decorem quoque urbi attulere. Erant tamen qui crederent veterem illam formam salubritatem magis conduxisse, quoniam angustia itinerum et altitudo non perindè solis vapore perrumperentur, ac nunc patulam latitudinem et nulla umbra defensam graviore æstu ardescere.—TACIT. *Ann.* lib. xv. 43.

warmth of the season and climate, and to the humidity of the atmosphere. All these circumstances have been already insisted upon, as most materially influencing the production of malaria: they have, however, an additional influence, namely, that of favouring its noxious operation upon the frame, by heightening the susceptibility of the subject. These, along with other causes which dispose the system to the invasion of the marsh effluvium, will come under notice when we speak of the various causes which co-operate with it in the production of the diseases depending, either altogether or partly, upon this very efficient agent. At present it will be sufficient to point out those diseases, which, occurring within the tropics, may be considered as more or less the effects of terrestrial exhalations.

With respect to intermittents and remittents, there can be no doubt that malaria is their efficient cause, although other causes may have predisposed the system to their supervention, or may have co-operated with malaria in occasioning them. It has already been remarked, that the severity of these diseases is generally in proportion to the warmth of the climate or season in which they occur; and it has been inferred, with much appearance of accuracy, for reasons some of which have already been adduced, that the more severe forms of these types of fever are owing to greater concentration or activity, in hot climates and seasons, of the malaria producing them relatively to the susceptibility and other peculiar circumstances of the individual affected. It also appears as a general result of extensive experience, that, in situations which are evidently productive, owing to their peculiar conditions, of a concentrated kind of effluvium, and particularly if animal matter combine with decayed vegetation in its formation; and if this effluvium is generated in a low, moist, deep, and rich soil, which has been subject to inundations, by a powerful sun, and during a moist, hot, and stagnant state of the air — circumstances combining to generate a more concentrated and malignant form of malaria — remittent and continued fevers of a most severe form, of a malignant tendency, and most dangerous as regards their issue, are the result. Even yellow fever, in its worst forms, seems to be the consequence of these causes operating, in a state of great activity or concentration, upon highly disposed subjects.

In situations also where the noxious influence of malaria is increased by the free admixture of the miasms proceeding from animal matter in a state of decay, or where the decay of animal or vegetable matter goes on rapidly together, and when they are moreover reinforced by the exhalations elicited from the lower strata of the soil by the action of the sun's rays, then the effects produced upon the human constitution are of the most malignant description. That the worst forms of fever proceed from this cause cannot be denied; for observation has traced their origin thither in almost every instance; and even the plague, when it breaks out in Cairo, seems to depend upon a similar cause for its origin, although others may combine with it for the full production, development, and diffusion of this form of disease. It has been noticed by Prosper Alpinus, and others who have had the best opportunities of observation, that the plague frequently breaks out in Cairo after inundations of the Nile, which have exceeded their usual bounds, and have left a quantity of slime, with vegetable and animal matter in a state of decay, beyond the reach of the drains and canals.

The fever proceeding from marshy effluvia, and from the miasms generated by vegetable and animal matter, assumes various forms or types, according to the particular circumstances in which they originate,—whether conditions of the locality, the nature and concentration of the miasm, the warmth of the climate or season, the state of the air, or the peculiarity and state of predisposition of the individual affected. As these vary, so do the particular character of the disease; and accordingly we have intermittents of various types and grades;—remittents of every degree of severity, and variously characterised; some assuming the bilious character, others the inflammatory; some being both inflammatory and bilious, and others being malignant and quickly fatal, or assuming a typhoid and putrid form towards their close;—continued fevers of every form, grade, and complication, mild in the one case, inflammatory in the other; in this case, marked by excitement at its origin, and soon terminating in depression; in the other case, beginning mildly, but insidiously, and terminating in great local derangement and disorganisation; and in a third instance, marked by great vital depression, which

never rallies, by a most offensive and unnatural state of all the secretions and excretions, and a tendency to putrefaction, which rapidly advances the moment that respiration ceases : and lastly, as respects fever, we have intermittents of a severe type running into remittents, and these latter into the continued form ; both the one and the other being pure and uncomplicated in their character, on some occasions and under certain circumstances, and under others variously complicated, every important viscus of the body, in some case or other, becoming more particularly the seat of disease.

But although we have as yet spoken of fevers as the only effect produced by malaria upon the human constitution, other diseases of a most formidable description result from the same cause. The next disorder in importance to fever proceeding from marsh effluvia, is dysentery. This latter disease, particularly when it occurs as an endemic or in an epidemic form, results as unequivocally from this cause as any of the types of fever which have been now enumerated. When it is met with sporadically, and amongst soldiers, particularly in some situations, both in India and in temperate climates, it doubtless depends more upon the habits and conduct of the individual than upon any other cause. Vicissitudes of season and climate alone, with neglect of the state of the bowels and the immoderate use of spirits or intoxicating drinks, and of unwholesome articles of diet and acid fruits, will of themselves produce certain forms of dysentery. But these are, in warm climates, oftener only the predisposing and determining causes of that more efficient agent now under consideration. In all cases, however, their action very greatly assists its operation ; and without which assistance, most probably no disease would have been induced by it. That terrestrial or marsh effluvia are efficient towards the production of dysentery, particularly when this disease is endemic or epidemic, is proved by its prevalence, chiefly or entirely, in situations where, and during seasons when, malaria or vegeto-animal miasms abound. There is not a province in India or its Archipelago that has not furnished instances of this fact ; and many of the proofs have fallen under our own observation. The expeditions to Batavia, and the capture of that colony in 1811, and the more recent expeditions to Ava,

have shewn it most satisfactorily*. Sir John Pringle has informed us that he has observed this disease to prevail in one part of an encampment, and intermittents and remittents in the other parts. Similar facts are recorded with respect to the French armies during their occupation of Italy and Germany, and are well illustrated by M. Vignes, in his work on dysentery.

There is no doubt that the scorbutic form of dysentery, which is well described by Mr. Bampffield, is chiefly dependent upon marshy effluvia, when this cause operates upon individuals imperfectly fed, or fed only upon salted provisions, and, at the same time, so thinly clothed as to allow the vicissitudes of weather, temperature, and season, to have their full effect upon the surface of the body. The scorbutic dysentery which prevailed at Rangoon, and amongst the soldiers and troops engaged in the expedition to Ava, well illustrates this fact; and the endemic of the Milbank Penitentiary, according to every information which has come before us, is also conclusive on the same point.

What the particular circumstances are which occasions marsh effluvia in the one case to produce fever, and in another dysentery, cannot always be precisely known. They are, however, very evident on many occasions, as will be shewn when we come to consider the subject in its appropriate place. We may, nevertheless, mention imperfect clothing, vicissitudes of temperature and weather, exposure to wet, night air, and cold dews, particularly after great heat or exposure to the sun's rays; whatever suddenly chills the surface of the body; the use of irritating food, of spirits, and unripe fruit, and of impure water, particularly if it be taken from places whence malaria is given off, or if it abound with animalculi or the infusoria, &c.

Besides those diseases, marsh miasmata seem also to be productive of disorders of the large glandular viscera, more particularly the liver and spleen. The influence of this agent, in occasioning diseases of these organs,

* See the Papers in the Appendix.

particularly when it acts conjointly with heat, is evident, although much less so than in the production of fevers and dysenteries; and its operation is much more difficult to explain in the former than in the latter. It is true that many of the instances of diseased liver and spleen, which occur in warm climates, are induced consecutively upon intermittents and remittents; but they often occur primarily and endemically, evidently shewing their chief dependance upon the exhalations proceeding from the soil. There is seldom seen, within the tropics, a case of disease in which, upon dissection, the liver and spleen are both sound. There seems also to be a tendency to determination to either one or other of these organs, in all cases of fever arising from marsh effluvia; for even in cold and temperate climates the liver or spleen is affected, or becomes so if fever from this source is prolonged; and the local affection is acute in proportion to the warmth of the climate or of the season in which the disorder supervened. From this it may be inferred that the habitual exposure to malaria, even when it fails of inducing fever or dysentery, and more readily if it gives rise to those diseases, will produce disorder of the liver or spleen, or of both. Whether the production of visceral disease in preference to fever depends upon the action of a weaker dose of the marsh poison relatively to the circumstances proper to the constitution of the individual affected by it, or rather upon the diet and regimen usually adopted whilst exposed to its influence, it may be difficult to decide. To us it appears more conformable with the result of observation, to account for the circumstance by the latter supposition.

There is one circumstance which becomes apparent upon a superficial inspection of the tabular returns contained in the Appendix, namely, the extreme disproportion between the number of those cases of disease which occur from malaria amongst Europeans and the natives of the country. It seems as if the European constitution had an inherent predisposition to be affected by this cause; and that the adaptation of the human frame to the climate, of which we have already made mention, is especially manifested in the diseases which supervene among its exotic inhabitants comparatively with those which occur among indigenous races. It has long been observed, in countries subject to marsh effluvia, particularly those which enjoy a warm

climate, that, even when they do not act sensibly in the production of fevers, or even of any of the diseases we have particularised, they are very inimical to the duration of life in the white variety of the species, particularly in those who are born in the country. Dr. Jackson informs us that white females, born and residing in Lower Georgia, seldom reach the age of 40, and men scarcely ever attain to 50; while those who have arrived at manhood before they settle there, generally reach a good old age. In some places this influence upon the duration of life among white natives of a country abounding with malaria is still more remarkable. In Petersburg, at Virginia, no white person born there has reached the age of 23. Dr. Jackson saw an individual of 21, who was the only one who had reached that age, and he was quite decrepid and worn down, although he had never been confined by severe sickness. Bruce records similar instances among the white natives of the banks of the Nile, in Abyssinia; and analogous proofs may be adduced from various authors, shewing that the malaria of warm climates tends, according to its activity, to limit the extension of, or even entirely to cut off, a native white population, either by producing certain diseases, from some of which the indigenous races are in a great measure exempt, or by stunting their growth, or altogether blighting this variety of our species in their early youth, or in the course of their development, without causing any specific disease.*

* In illustration of this position, it may be stated, that children born of white or European parents in India require to be sent to Europe in order to attain due maturity and strength. If allowed to remain in India, they seldom present the appearance of health, even when they arrive at puberty. A greater proportion of them also die before they reach this epoch of existence: and it seems probable that children, whose parents have both been the offspring of Europeans, but born and constantly resident in India, would be still weaker, and less likely to arrive at maturity, or to reach the full physical development of the white variety of the species. Dr. Copland informed us, that children born at the European settlements on the west coast of Africa, of white parents, seldom reach ten years, if allowed to remain in the country. The case is, however, different when one of the parents belongs to the native races of the climate. How far the offspring of the white inhabitants of a country near the equator would become assimilated to the physical characters and constitution of the indigenous races, after several generations of unmingled descent and continued residence, is a point which cannot be decided from the evidence we yet possess on the subject. We may also mention at this place, that a change of climate is best endured by those who have previously arrived at full maturity.

Individuals belonging to the white families of mankind require to be previously brought to their full state of physical perfection, in order to enjoy their usually allotted span of existence, before they are removed to climates where the powerful agent of disease we are now considering is in full force.

In addition to the diseases we have enumerated as being produced among Europeans by malaria, and in addition to its blighting effects in warm climates upon a native white population, even when it fails of inducing active and specific disorder, we should particularize its influence in occasioning ulcers of the lower extremities, and foul sores, and even sphacelation and gangrene. Every military surgeon has numerous opportunities of observing, in the East, the relation which subsists between unwholesome situations and these disorders, both among Europeans and natives. Indeed, it seems to be a general and necessary effect of malaria to diminish the powers of life throughout the whole body; and the phenomena accompanying and indicating this effect are various, according to numerous concurrent circumstances, to predisposing causes, and to concomitant influences. Of these we shall have occasion to speak when the diseases proceeding chiefly from this grand agent come specifically before us.

Before we conclude these very general remarks on the diseases which may be viewed as the consequence of terrestrial emanations in a more or less marked manner, we may state it as our opinion, that cholera, in its severer forms, and in that form more particularly which has lately ravaged all the countries in the East, is in some measure caused and influenced by this agent. Proofs of this will be adduced in their appropriate place, and with reference to the extent to which this cause may be considered as being efficient of this form of disorder.

In further illustration of this subject it should be remarked, that epizooties or epidemics amongst the lower animals generally prevail during warm seasons, and are more particularly severe towards the close of hot summers and autumns consequent upon heavy rains and inundations,

and that they frequently appear upon the occurrence of heavy rains immediately following a long, hot, and dry summer and autumn. And it is a fact deserving of consideration, that the diseases which become epidemic amongst the lower animals, whether in warm climates or in temperate countries during hot seasons, generally present similar derangements and structural lesions of the internal viscera to those remarked in the human species. This is the case particularly in marshy situations, and in places subject to inundations. Facts illustrating this have frequently fallen under our own observation, and are very judiciously treated of in M. Bailly's excellent work on the Intermittents of Italy.

It will naturally be inquired, In what manner does the marshy effluvium affect the human system, and how becomes it productive of disease? On these topics nothing positive or directly demonstrative can be adduced; inasmuch as the intrinsic nature of this agent has not yet been discovered. But observation has supplied data, which, when calmly considered, seem to shew that terrestrial emanations, and all those causes of disease which float in the atmosphere, make an impression on those surfaces with which the air comes in contact: and this impression, when sufficiently strong, or frequently made, is productive of disease, either of the system generally, as in fever, or of some important viscus, as the liver or spleen. It is, therefore, chiefly to the internal surfaces of the lungs and air passages that we are to look as the channels through which malaria makes its hurtful impression upon the animal frame. But whether it acts by deranging the healthy condition of the nervous system of the organ, which derangement produces farther disorder until specific disease is fully formed; or whether the exhalations floating in the air are actually absorbed from the surfaces of the air passages and cells into the blood, vitiating this fluid, and, by its presence there, deranging the whole system, or some important viscus, it is impossible to decide. Both sides of the question have found supporters who have adduced arguments in behalf of their opinion, in the absence of positive proofs. On a subject where sufficient evidence has not been obtained, and where it scarcely can be obtained in the present state of our knowledge, it is almost impossible to come to a decision. As far, however, as circumstances

serve either directly or indirectly to elucidate the subject, it seems to us most probable that the noxious impression of malaria upon the system may be made through the medium of both the nervous system and the blood.

That this agent is destructive to the powers of life admits not of a doubt, although pathologists differ as to the mode in which this effect is brought about. Dr. Cullen supposed it to be a direct sedative, by which the energy of the living system is diminished, and a spasm of the extreme capillaries produced; and that, if the power of the system, or the *vis medicatrix naturæ*, is not entirely overpowered by it, reaction supervenes in order to overcome this spasm, and the febrile action is fully formed. Other pathologists suppose that the marsh-effluvium acts as a stimulant, and that the debility which it obviously occasions, is a state of exhaustion consequent upon previous excitement. Neither of these theories accounts for the whole phenomena, which diseases arising from this cause evince throughout their course, and according to their varying manifestations; although either explains many of the symptoms which are usually observed. That malaria is destructive to animal bodies, and overturns that vital affinity which exists between their material elements, is shewn by the fact of dead animal matter running on faster into putrefaction, in situations where this poison abounds. Nor is its power of destruction limited to animal matter: there is good reason to suppose that its presence is destructive of all organised nature, vegetable as well as animal, the latter most particularly, whenever their vitality sinks so low as not to be capable of withstanding its noxious influence. Whatever influence, therefore, may be imputed to this agent, or in whatever manner it operates its effects upon the living body, there is every proof in favour of considering it as a powerful septic. Thus it may be readily shewn that animals killed in a situation abounding in malaria run much more speedily into putrefaction, than in healthy situations; although the temperature, and state of the air as respects moisture and motion, are the same in both; and in many cases this septic operation is evinced by its effects upon injuries, wounds, and sores, even during life. It has also been repeatedly proved, that substances fabricated of silk, woollen, and even of cotton and flax, and

exposed to marshy exhalations, will rapidly undergo decay; silk and woollen substances becoming putrid; or swarm with maggots and worms; and cotton and linen at first lose their white colour and assume a dingy or yellowish hue, and afterwards are covered by an efflorescence, and soon afterwards their cohesion and organisation are completely destroyed. These effects are generally rapid and complete in proportion to the moisture and warmth of the air; and as the conditions which we have shewn to be productive of malaria may be in full force, and its presence consequently more abundant. So well are these effects of terrestrial exhalations upon animal and vegetable substances known to the more intelligent of the inhabitants of Italy and the south of France, that they are generally recognised as indications of the insalubrity of particular places and seasons.*

Having discussed the nature and effects of malaria, we next take a hasty survey of those circumstances which favour its action on the body. All persons exposed to terrestrial exhalations are not equally affected by them; or there are certain conditions which favour their operation on the human body. These are generally whatever debilitates the frame and increases the susceptibility and excitability of the system,—such as previous disease; previous exposure to excessive heat, and to the direct rays of the sun; great bodily exertion when so exposed, particularly during a close state of the air; poor diet; the use of salted provisions, and of spirituous liquors; want of sleep; excessive evacuations; debauchery, &c. The indirect debility proceeding from the use of stimulating and heating liquors, sauces, and articles of food, frequently predispose the system to the influence of marshy exhalations, and the excitement which they primarily occasion generally creates a disposition to diseases of the liver and spleen, and, in cases where such disposition is already formed, kindles active disease of these viscera.

Excessive indulgence of any of our appetites is always followed by satiety, debility, indolence, and a languid and sometimes an oppressed state of the circulation. At these periods, the nervous influence is as much diminished as

* See M. Monfalcon's work on Marshes.

the energy of the circulation is oppressed and weakened. Under such circumstances, both the nervous and vascular systems are more easily invaded by those causes of disease which made their immediate impression in these quarters, and are more readily influenced thereby. Impressions, also, made primarily upon the nervous system, are necessarily extended to the vascular system, which in its turn becomes deranged, and thus disorder is extended to all the general tissues and organs of the body to a greater or less extent. But of all the circumstances favouring the impression of morbid causes upon the body, there is none whose influence is more marked than the depressing passions of the mind. This has been evinced on a large scale in many of our campaigns in the East, and in our expeditions for the conquest of colonies within the tropics; and the beneficial effects of hope, excitement, and constant employment, in warding off the impression of the efficient causes of disease, have been fully demonstrated, as well as the baneful consequences of disappointment, anxiety, and the other lowering influences fully shewn. Very numerous instances, illustrating the opposite effects of hope and disappointment upon the human system, when subjected to the endemic and epidemic causes of diseases, have come before us, during our service in India and its dependencies.

Of the various circumstances favouring the invasion of the causes of diseases, there are few more general in their operation, or influential as respects the resulting effects, whether considered in relation to warm climates, or to temperate countries during hot seasons, than indolence. Inactivity of mind has a most relaxing effect upon the nervous system, exposes it to the impressions of external causes, whilst it leads to inactivity of body; and both combine to generate plethora, diminish secretion and excretion, and thus to derange the functions of the internal organs and to vitiate the whole mass of fluids, and, through them, to disorder all the functions and secretions of the body. Indolence of mind also, and the want of salutary recreations and employments, throws individuals often in the way of many hurtful seductions and indulgencies, which otherwise would not have been thought of.

On the other hand, employments and pursuits which interest the mind,

and impart a salutary excitement throughout the whole frame, tend in no small degree to ward off the invasion of the usual causes of disease, and to promote all the more important animal functions.

Before concluding our brief remarks on this topic, it should be observed, that during sleep the body is more open to the influence of malaria, and indeed of all those causes of disease, which, floating in the atmosphere, are received with it into the lungs; and the predisposition is the greater during the sleep which follows great excitement and exertion. Much previous exertion, particularly under exposure to the sun's rays, exhaust the powers of the body; and in this state of exhaustion and of sleep, noxious emanations of every description make a deeper impression upon the system. Experience of this has sufficiently taught the inhabitants of districts adjoining swamps or low marshy situations, in Italy and Greece, to retire at night to the hills and elevated places; for at this period, malaria is more concentrated, and the body, relaxed and overwhelmed by sleep from the fatigues of the day, more disposed to become affected by it. Soldiers and sailors, whose occupations, habit of body, and modes of living, are such as to render them highly disposed to the invasion of marshy exhalations during sleep, seldom are so exposed to them, particularly when on wooding and watering duties, without becoming the subjects of fever or dysentery. Proofs of this are of daily occurrence within the tropics, more particularly in the East and West Indies, and on the coast of Africa; and the danger of sleeping when travelling at night, during the autumn, in any of the unhealthy districts of Italy, is well known to every traveller in that country.

SUB-SECTION IV.

Of the Means of preventing the Generation of Marsh-Miasmata, and of counteracting their Effects upon the Human Body.

SOME of the remarks which more properly fall under this head have been advanced in that part where the circumstances productive of malaria were considered, as serving to illustrate that particular branch of the subject. With respect to *the means of preventing the generation of malaria*, our limits admit only of our pointing out the advantages resulting,

1st. From *draining* all marshy places where this means can possibly be resorted to. The good effects of draining are too obvious to require illustration. It is only requisite to state, that situations requiring to be drained, will be rendered healthy in proportion to the extent and perfection of the measure, and to the clean state in which the drains are kept. In warm climates, the difficulty of draining is greatly increased, as well of keeping the drains themselves in due order; yet the benefit resulting from the measure is obvious. It should, however, be recollected, that marshy grounds, reclaimed by draining, are not altogether exempt from the causes of disease, more particularly in certain seasons; for the drains and ditches themselves cannot always be kept in a state altogether incapable of generating malaria. But disease is greatly diminished by the measure, and the soil is thereby rendered susceptible of cultivation, and subservient to the better support of its inhabitants.

2dly. It is in many places obviously impossible to put draining into practice, owing to their low situations, and to the inundations of rivers or of the sea, to which they are liable. Under such circumstances, *embankments* may be often resorted to with advantage. But the exact conditions requisite to the obtaining of salutary effects from embankments should be considered,

and due regard should be paid to the question, whether or no the embankment will tend to prevent the flowing off of the water after heavy rains, and whether it may not be more injurious in retaining inundations when they occur, than beneficial in preventing them. Every thing in relation to this, will depend upon the exact circumstances of the locality, and the manner in which they are viewed by those who wish to control them.

3dly. In situations where neither draining nor embankments can be resorted to, as in fens, swamps, and bogs, in the depths of valleys and along the banks of rivers, or near æstuaries, then advantage will often be derived from *covering them entirely with water*: for lakes do not exhale miasmata until the mud and soil of their bottoms and sides appear. Senac states, that the neighbourhood of a large town became unhealthy as soon as the mud at the bottom of some adjoining morasses was exposed to the action of the sun and air; but that disease disappeared when they were completely inundated. It has often been observed by us, in various parts of the East, that little disease, and that of a slight intermittent form, was prevalent whilst the sources of malaria were completely inundated; but that as soon as the water was evaporated, and the soil exposed to the sun, covered by slime and vegetable and animal matter, fevers of a severe form made their appearance. Numerous instances of this have been recorded by writers on the diseases of the West Indies. Dr. Rollo mentions, that in St. Lucie the greater part of the regular and mild intermittents appeared during the rains, when the marshes and pools were filled, and that the dangerous fevers made their appearance when the water covering these places was evaporated, leaving a bare and slimy surface to the sun's rays; and precisely similar facts were observed by us at Seringapatam. The ditch round the ramparts of Geneva was at one time drained, and sickness became prevalent in the vicinity, and continued so until it was again filled. But it is unnecessary to enumerate instances illustrating what is already obvious: for water covering the sources of malaria to any considerable depth, has the effect of keeping them from the action of the sun and of the air, and of absorbing whatever of this deleterious substance may be generated.

4thly. *Cutting down woods and forests*, and clearing the soil, so as to subject it to assiduous cultivation, is another means of preventing the generation of malaria. We have already made some remarks which shew that this means of preventing the generation of marsh poison is often productive of it in a more concentrated form. This is more especially the case within the tropics, in low swampy places near the sea coast. Dr. Rush states, that in Pennsylvania intermittents have increased in severity and frequency since that country has been cleared. Fever was more frequent and severe after clearing Penang in 1801 and 1802; and the same has been remarked with respect to the West Indies and other places of America in a former part of these observations: so that it may be considered as a general approximation to the truth, that low and marshy situations become still more unhealthy when the trees and woods upon or around them are cut down, unless they are subjected to a careful drainage and cultivation; and even for the first two or three years of such culture, they are at particular seasons productive of disease. As respects, however, clearing woods or forests, covering sloping grounds, dry situations, and the sides of hills, there can be no doubt of the salubrity of the measure, and particularly when these places are afterwards subjected to due cultivation.

The measures which should be taken, after having resorted to those which are calculated to prevent the generation of malaria, are those that tend to confine it to the source that generates it. In many places, neither drainage nor embankments can prevent the formation of terrestrial exhalations. Under these circumstances, it will be found advantageous to cover or surround these sources of disease by tall forest trees, which will confine the exhalations which they generate within their own limits. Where towns or cities are built upon soils and in situations which render them unhealthy, very great advantage will be uniformly derived from making large and deeply situated sewers and drains, which should be well built and arched over, and from attention to paving, and to the constant removal of the mud and filth which accumulate in narrow lanes and streets. It appears also established beyond a doubt, that the narrow winding streets of many of the towns and cities which are built in low situations and in the vicinity of marshes and lagoons, are, especially when

the houses are high, actually conducive to health, inasmuch as the exhalations transported from thence have less ready access to every part of them; and the horizontal currents of the air are interrupted or entirely broken by the first buildings which oppose them. When the streets are narrow and the houses high, provided at the same time that they are always clean and well paved, the sun cannot act upon the soil on which a town is built; for if it at any time shine upon the streets, the period is very short, their narrowness and crookedness, and the height of the houses, being a constant obstacle. The unhealthiness of towns and cities, in warm climates more particularly, arises from the want of those well-constructed drains and common sewers which carry off the exuviae and filth of the inhabitants. In many towns there is no such provision: the filth and putrid water, loaded with animal and vegetable matter in decay, run down the narrow streets in sluggish rivulets, or stagnate before the houses of those who deservedly suffer from it; and the grosser parts are often gathered into heaps, until washed away by a kind Providence, who provides, in the immensity of its works, and in the storms which seem to threaten his immediate existence, against the indolence and ignorance of man.

When accumulations of filth are formed upon the surface of unpaved streets, or upon ground in their vicinity, the more fluid parts slowly sink into and mix with the soil, while the gaseous products which are formed vitiate the atmosphere. These latter are direct sources of disease, which are re-enforced and rendered still more noxious by the exhalations proceeding from the soil itself, enriched and made fertile of such products by the fluid filth,—the animal solutions which are continually being poured into it. But not only are the streets and lanes of towns in warm climates, lying low and unprovided with common sewers and other sources of cleanliness, loaded with filth, but even the more concealed places, as the woods, groves, and jungles, for a considerable distance around them, are mires of corruption, and the receptacles of ordure, and animal and vegetable exuviae and remains; thus furnishing additional materials for the generation of noxious effluvia to places which already abound with them.

The healthiness of the inhabitants of any country depends much upon

their choice of situations for their habitations. Care should be taken in warm climates, more particularly where the winds generally blow from particular quarters, at certain seasons and hours of the day, to erect the buildings, or to form encampments, or even to take up a temporary abode, to windward of marshes, or of those sources of disease which we have so fully described. This precaution cannot be adopted so efficaciously in northern and temperate climates as in intropical countries, owing to the variableness of the winds in the former ; but yet, in many of the latter it may be attended to in various particulars, more than is usually the case. When necessity compels a temporary residence to leeward of a swamp, then advantage will be obtained from lighting fires between the place of residence and the source of disease ; and much benefit will be derived from having double-walled tents, within which fine musquito-curtains may also be used. Houses and buildings, either standing near or to leeward of any source of malaria, should be perfectly shut on the side towards those places : if they are actually built upon an unhealthy situation, the ground floor should be left entirely unoccupied, and should be so open on every side as to allow complete perflation.

From the information furnished us by Dr. Copland and Mr. Alcock, respecting the extraordinary effects of the clorurets of lime and of soda, in destroying noxious emanations, we consider that the manufacture and use of them in India and in other countries within the tropics would be extremely advantageous. Dr. Copland informs us that he found a small quantity of the solution of the cloruret of the oxide of lime sufficient to remove the disagreeable odour proceeding from sewers, in every instance ; and we are persuaded that the same agent might be most advantageously employed in many instances, in order to destroy the emanations from those places within the tropics which are more remarkably unhealthy, particularly in large towns, and when the emanations proceed from foul drains, sewers, and ditches, &c. For farther information respecting this substance, we refer our readers to Mr. Alcock's interesting treatise on the clorurets.

We shall conclude our observations on the present part of our subject

with some remarks on those means which may be resorted to by persons who are necessarily exposed to the influence of malaria. Besides the measures which we shall presently advert to, the observations which will be hereafter adduced respecting the modes of living in India and our inter-tropical colonies usually adopted by Europeans, will furnish further information as to our ideas on this topic. At present we shall confine ourselves to those prophylactic means of a medical nature which have been sometimes recommended, and which are calculated to be beneficial when the exposure to terrestrial exhalations is of a short duration, or only of occasional occurrence.

Medicines may be taken frequently with advantage, particularly such as tend to promote the secretions and excretions, without materially lowering the vital forces. A costive state of the bowels should always be prevented, by means which correct and regulate the state of the biliary and intestinal secretions, at the same time that they assist the abdominal viscera in circulating and discharging their contents, whenever their functions are torpid. For this purpose, a few grains of blue pill with the *pilula aloës cum myrrhâ* may be taken at bed-time, and a bitter aperient draught in the morning, consisting of equal parts of an infusion of senna and gentian.

The diet of individuals exposed to malaria should be nourishing, but not heating. Animal food should be taken sparingly, and spirituous liquors and strong wines ought to be entirely avoided. The lighter and thinner wines may be resorted to in moderation, but excess even in them should be shunned. Exercise should always be taken in the cool of the morning and evening; and it should be regular, neither so much as to fatigue and exhaust the system, nor so little as to occasion a languid and imperfect performance of the internal functions and secretions.

When the exposure to the influence of malaria, either at night or in the morning, is great, and at all to be dreaded, a moderate dose of bark, or of the sulphate of quinine, with a little powdered ginger or cayenne pepper, may be taken previously to such exposure: a fire should be lighted during the

night in the apartment or in the vicinity of the spot of residence; and care be taken that the raw night air should be excluded as much as possible, by means of curtains or tent cloths, and by closing the inlets of air in the direction of the sources of malaria. On occasions of this description, the use of segars or the hookah is often serviceable; but it should be indulged in only occasionally, and only as a prophylactic measure.

On all occasions the tenour of the mind should be properly regulated. The depressing passions ought to be avoided on the one hand, and all undue excitement of the spirits, as liable to be followed by depression, should not be indulged in on the other. A calm, confident, and well-employed mind, moderately occupied and interested in the objects of its pursuit, — unruffled by vicissitudes of temper, and undisturbed by inordinate indulgence of its desires, — with a moderate but sufficient gratification of its wants or wishes to give a foretaste of more perfect fruition, and to leave still more to hope for and to aspire after, so that its capacity of gratification be not exhausted, or its means of enjoyment diminished, — is, upon the whole, that state of mind which most successfully opposes the causes of disease which have been treated of in the foregoing pages, and which, assisted by the sensual indulgences of some, the ill-regulated passions and dispositions of others, and the neglect and carelessness of many, prove so destructive to European constitutions and to life itself in intertropical regions.

SECTION II.

*Of the Climate and usual Course of the Seasons in the British Possessions
in the East, &c. &c.*

HAVING taken a general view of the sources of malaria, we shall next consider the climate of India, and view it in relation to the seasons, and the peculiarities

which they present in particular places and districts. Commencing with the BENGAL PRESIDENCY, the circumstances influencing its salubrity first require attention.

The soil of this province is a rich, deep clay, with a considerable proportion of silicious sand, fertilized by various salts, and by animal and vegetable remains. Calcutta, the seat of Government, was formerly surrounded by the sources of malaria to a greater extent than it is at present. Swamps, muddy lakes and pools, and woods and jungles, formerly enclosed the town; but now, the lakes and swamps are filled up and drained, and the woods partly cleared away. Still the situation of this city, together with the narrow, dirty, and unpaved streets of the native town, furnish numerous sources of disease, particularly after the rains, and shortly before their commencement, when the warmth and closeness of the weather are excessive.

The rains generally commence in the beginning of June, and terminate about the middle of October. If the rains are late in setting in, the intense heat and closeness of the air are generally productive of great disease, particularly in those districts which are in the vicinity of swamps, or places which are usually under water, but which become exposed during a protracted warm and dry season. If the rains terminate suddenly about the end of August, or through September, as occasionally happens, disease then becomes prevalent, particularly amongst Europeans; for the sun's power is in these months but little diminished in the latitude of Bengal, and the inundations are rapidly dried up, leaving the low grounds covered by a rich slime, and by vegetable and animal matter, exposed to the action of the sun, which is then vertical. Hence the production of unwholesome exhalations goes forward much more rapidly, and the rice crops are at the same time much injured by being left dry before they are fully ripened. The badness of the rice, and the scarcity, which are the consequence, further tend to generate disease, particularly among the natives: and if the atmosphere remain long still and warm after the sudden cessation of the rains, fevers and dysenteries prevail to a most alarming extent amongst both Europeans and natives. The inundations begin to subside with the termination of the rains; but in many places they are not entirely dried

up until the end of December. After the rainy, succeeds the cold season. During this period fogs are frequent, particularly in the morning and sunset; and the dews are copious during clear nights, when the fall of temperature is also very considerable. The warm season commences with March, and in the months of April and May the heat is often excessive.

As it is important that a right understanding of the usual course of the seasons throughout the extensive province of Bengal should be entertained, we cannot better contribute to this end, than by quoting the very exact and succinct account of them given in Mr. Jamieson's excellent Report on the Epidemic Cholera :—

“ The cold season commences with November, and ends in February. About the middle of October the weather begins perceptibly to change. The days are still oppressively hot; but the mornings and evenings gradually become cool. The wind, which during the preceding months had blown generally from the south and east, now begins to come round to the west and north, and to carry along with it those heavy masses of clouds which almost constantly float about and obscure the horizon during the whole of the rains. The atmosphere, from being very damp and watery, grows dry and elastic, and the heavens begin to brighten a little. But these appearances are not yet uniform; the sky still at times becomes gloomy and overcast; and heavy showers, accompanied by thunder and lightning, shew that the south east monsoon has not yet finally taken its leave.

“ In *November*, the weather becomes delightfully fair and pleasant. A cold sharp wind now blows steadily from the north. The air is dry, clear, pure, and serene; the vault of heaven is of a beautiful deep azure colour, and in general not a cloud is to be seen. The nights are clear, with heavy dews. The thermometer,* in the shade, ranges throughout the month from 66 to 86; the mean heat about 74; medium altitude of the barometer, 29.98.

* Throughout this Essay the thermometer is spoken of only in the shade.

“ As *December* comes on, a considerable change takes place. Although the middle of the day and the afternoon be clear and fine, a haze generally, towards evening, collects round the horizon, and obscures the setting sun. As the night advances, thick fogs, sometimes general, sometimes partial, begin to collect, and do not disperse until morning. As they are broken up by the influence of the sun's rays, their vapours rise and form grey masses of clouds, which render the early part of the day hot and unpleasant, and do not disappear until it is far advanced. These fogs do not by any means occur every night. Sometimes, though rarely, the whole month passes over without them; ordinarily they appear only three or four times; sometimes during several nights successively. As in November, the north and west are the prevailing winds. They are very sharp, but blow steadily, never rising to a gale, nor falling to a perfect lull. The range of the thermometer is from 56 to 78; the mean temperature about 70; altitude of the barometer 30·01.

“ During *January* much the same weather prevails. The air is serene and piercingly cold. The wind blows steadily, and perhaps more forcibly, from the north and north west, than in December. Fogs are still very frequent, and sometimes so thick, that scarcely any object is visible until a late hour of the morning; and every thing exposed to the external air becomes wet and covered with drops of moisture. They may often be seen rolling in large dense bodies in opposite directions. During the clear nights, heavy dews fall. The range of the thermometer is from 47 to 75; the mean heat about 68; altitude of the barometer 29·99.

“ The weather keeps very pleasant until the second week of *February*, when the middle of the day grows warm; and the change of the wind to the south and east, and the collection of clouds in the horizon, with threatenings of thunder gusts, portend the approach of the hot season. At night the air is raw and cold; and the mornings are foggy. The thermometer ranges from 65 to 82; the mean heat 76; altitude of barometer 30·3.

“ Sometimes a few heavy and refreshing showers fall about Christmas;

but the whole of the cold season is generally marked by the total absence of rain. It is remarkable how invigorating the cold bracing wind of the north, and the pure elastic air and clear sky of these months, prove to the European constitution, harassed and broken down by the previous long continuance of moist and oppressive weather. The appetite and strength, which had long before failed, now return; and the whole frame becomes light and springy. Vegetable nature partakes of the generally salubrious effects of the season; and garden plants and exotics, at all other times killed by the excessive heats, now grow with freshness and vigour.

“ The hot season may be considered to set in fairly with *March*. The sun now becomes very powerful; and the days are warm, and even hot. They are, however, prevented from being oppressive by the strong and steady winds uniformly blowing from the south. Fogs are yet not uncommon in the mornings; and as they clear up, go to the north to form, with the thick, dispersed masses of clouds that are constantly drifted along the horizon by the wind, materials for the approaching storms. These storms, which by the inhabitants are termed north-westerns, do not, however, generally occur till towards the middle and end of the month. They are usually preceded, during several days, by cloudy mornings and strong gales. Then, for one or two evenings, comes on distant thunder, with strong gusts of wind, but without rain. Towards the afternoon of the day in which the storm is to occur, the wind, which during the morning and forenoon had been continued and boisterous, begins to fail, and at length settles into a dead calm. The air becomes oppressively sultry. The clouds gather in the north west, and form a deep, dense, lowering bank. Vivid lightning, accompanied with heavy thunder, and gradually advancing nearer and nearer, indicates the immediate approach of the storm. At length, the calm is suddenly interrupted by a tremendous burst of wind, and by clouds of dust, which darken the horizon. Then follow torrents of rain, with close and heavy thunder; and these are soon succeeded by a serene sky and cool air. The appearance, however, of these sudden commotions is not always the same — sometimes a shower of hailstones precedes, or comes in the place of the heavy fall of rain: sometimes there is no rain, even when the fury of the wind and quantity of the lightning are excessive. The general time of their coming on is about

sunset; they rarely occur earlier than six in the afternoon, or later than midnight. When the days keep clear, and the wind moderate, heavy dews fall at night; but in blowing weather there is no dew; the moisture as it settles being carried off by the wind. Range of the thermometer from 73 to 86; mean temperature 79; altitude of barometer 29·86: the fall in the mercury being ascribable to the prevailing high winds and increasing rarefaction of the air.

“ *April* has generally blowing weather throughout. The prevailing wind is still the south. The atmosphere is sometimes clear, generally hazy, with much dust, and thick loose clouds continually moving to the north. The weather is hot, but pleasant, till towards the end of the month, when the nights become close and sultry. The general closeness, however, is from time to time relieved by thunder-storms and seasonable falls of rain. The wind usually becomes hot to the feel about the 20th; and so continues to the end of the succeeding month. Range of the thermometer from 78 to 91; mean heat 84; barometrical altitude 29·75.

“ *May* is the most disagreeable month in the year. In the commencement there is high wind at times; but during the greater part of the month the weather is exceedingly close, still, and oppressive. The nights, especially, are sultry. There is little or no wind in the mornings, which are thick and hazy, with low, gloomy, scattered masses of clouds. But as the sun rises, a breeze springs up from the south, and keeps gradually freshening until the evening, when it again fades away. The air is hot, but inelastic; and as it does not carry off the perspiration, leaves the body moist and clammy. The dejection and lassitude now universally produced by the great heats, are, however, fortunately removed by the frequent recurrence of violent north-westerns, with their usual accompaniments of thunder and rain. There are no fogs during April or May. The thermometer ranges from 81 to 93; mean heat 86; barometrical altitude 29·60.

“ In some years, but not always, nor even generally, between the 15th and 25th of the month, the horizon becomes overshadowed with dark thick clouds from the south east quarter; and much rain falls during several

days; constituting what are called the lesser rains. But more commonly the close muggy weather continues with little interruption until the end of the first or the beginning of the second week of June, when the veering round of the wind towards the east, the occurrence of thunder in the evening, and the constant cloudy state of the atmosphere, indicate the approach of the regular rains. These commence from the 4th to the 18th of June, and continue with frequent variations during the four following months. At first, they set in with thunder-showers, sometimes heavy, sometimes light, generally from the south and east. Then follow several days of very heavy rain; during which the sun is completely hid from view. Then there is a shew of fair weather, with sunshine, and beautiful clear nights; but this is of very uncertain duration, and liable to be interrupted with scarcely any previous warning. The heavy rain rarely keeps up for more than forty-eight hours at a time; then gradually diminishing to drizzling, and at length giving way to fair weather. There is at frequent intervals, during the whole period of their continuance, much vivid lightning, with violent thunderstorms, and strong gusts of wind. The wind frequently changes from east to south, and west; rarely to north. Its return to the east, and fixing steadily in that quarter, is usually accompanied with heavy rain.

“ As soon as the rainy season has fairly commenced, the atmosphere becomes manifestly cooler, and the weather in general very pleasant; the only exceptions being now and then a sultry night, and the dead oppressive calm which sometimes precedes a storm. From the dust and other particles floating about in the atmosphere being carried away by the successive showers, the sky during the intervals becomes beautifully clear, the sun shines with great splendour, and the nights are bright, with innumerable stars. There is very little variation of the atmospherical temperature throughout the season. The thermometer ranges from 77 to 88 or 90; the mean heat being 81, or perhaps a degree or two higher. The air, from the constant rain, becomes surcharged with moisture; and every thing exposed to it gets damp and mouldy. There is consequently little alternation in the barometer. The mean altitude is about 29·45. It is higher at night than in the morning, and lowest at mid-day.

“ In *September* the barometer is observed to rise a little; but there is

little perceptible change in the weather till the middle of *October*. The rain then begins to abate; the showers are fewer in number, and though heavy, of short duration. The wind gets very variable. There are still frequent shows of thunder and lightning; but they generally pass off without producing rain. The days are yet sultry; but the mornings and evenings begin to grow cool, and the increasing clearness and elasticity of the air, with the coming on of dews at night, presage the speedy accession of the COLD SEASON. At length the veering round of the wind to the west-north-west quarter, the disappearance of clouds and vapours from the horizon, the sharpness and dryness of the air, the rapid rise of the barometer, and concomitant fall of the thermometer, towards the end of the month, evince the entire departure of the rains. The total quantity of rain falling during the season varies much in different years. In Bengal, the average has been fixed at 70* inches."

The periodical winds that prevail in the Bay of Bengal extend their influence over the flat country forming the Bengal province. In that part of the province which faces the head of the bay, northerly and southerly winds blow alternately during unequal portions of the year; but in the northerly part of Bengal, and in the province of Bahar, the winds are diverted by the chains of mountains into the direction of east and west, thus taking the course of the Ganges. The same circumstance takes place with regard to Assam, the winds taking here also an easterly and westerly direction; and in the course of the Barrumpooter.

In speculating respecting the sources of disease in Bengal, the quantity of animal matter thrown into the Ganges, the Barrumpooter, and their contributory streams, should not be overlooked. These rivers receive the bodies of the dead, as well as the excretions of the living. But it is doubtful whether disease is much increased from this cause, unless when, from the occasional height of the tides in the mouth of the Ganges, putrid bodies and other animal matters are deposited upon some of the swampy places on their banks which are subject to inundation. The bars which are formed at the mouths of many of the Eastern rivers, and the elevation of the ground upon the margin

* The quantity of rain is here estimated too low. It cannot be under 80 inches.

of the coast, tend greatly to arrest the subsidence of the inundations, and to retain the animal matters in the situations where they are first deposited. The poverty and indolence also of the inhabitants prevent them from endeavouring to ameliorate the state of the country in which they live, and lead to those accumulations of filth with which the jungles in the vicinity of the small towns and native dwellings abound. The myriads of insects and reptiles generated after the rains, and which die at all seasons, particularly during the hot season and commencement of the rains, contribute, with the other materials which the country furnishes, to a generation of unwholesome exhalations. These circumstances, viewed in connexion with the face of the country and character of the soil, satisfactorily account for the diseases most prevalent in the province.

The low and alluvial soil which almost every where forms the province of Bengal admits chiefly of the cultivation of rice and indigo. Very few hills are to be seen of any considerable elevation, and those which exist present the appearance of gentle undulations of surface. The lower districts are all inundated during the rainy season with the waters of the Ganges. The number of rivers and navigable streams is so great, that during the rainy season there is scarcely any part twenty miles distant from a navigable river. The loose materials of which the soil is formed are readily invaded by the currents of the numerous rivers; and hence they frequently change their course, their banks constantly wearing away in one part, and new banks forming in another. The changes which thus take place in the course of the rivers occasion the exposure of a rich and new soil to the rays of the sun; and in many instances the vicinity of the new course of a river is inundated, owing to the shallowness and narrowness of its channel; whilst the old one becomes a noxious swamp. The change of the channel of rivers is often occasioned by the soil being washed away from the roots of large trees, which fall into the stream, choke it, and cause its divergence in a different course, leaving its former bed a lake or swamp, and giving rise to those exhalations which are productive of disease.

As the sources of malaria, such as we have described them in the preceding section, abound in all their forms in the province of Bengal, the causes of the prevailing diseases cannot be considered doubtful. The

following table will most clearly shew both the degree of sickness in the European army of the Presidency, and the comparative frequency of occurrence of those disorders which may be viewed as the endemics of warm climates. This table, which is formed from the returns made to the Medical Board of the Bengal Presidency, and which is an abstract from the more detailed tables given in the Appendix, furnishes the results of five years, and exhibits a view of the comparative rate of sickness during each season. The number of admissions and deaths under each disease are only given as shewing the proportion of sickness and the mortality. Thus, it will be seen in the table, that there are, during the five years, 13,773 admissions of fever, 8,893 discharged, and 315 deaths; but the difference between the admissions, and the discharged and dead, are those remaining in hospitals under treatment, and those transferred, &c.* From this table it will be also perceived, that fever is most frequent in the rainy and hot seasons; that dysentery and diarrhœa are more prevalent during the rainy and cold seasons; and that hepatitis and cholera are oftener met with in the hot season. The per-centage of admissions in the effective strength, of each disease, is also given in the table, as well as the per-centage of deaths in the admissions.

* Subtracting the 8,893 discharged from the 13,773 admissions of fever, there are 4880, from which subtracting the total numbers of deaths, 315, there are 4,565 left for remaining in hospitals. But it is evident that this number is too great, and cannot actually be in hospitals. Now, in making out, from the monthly returns to the Medical Board, the tables from which the following abstract is taken, the numbers standing in the column under the head of remaining in hospitals were added up in common with the other columns, so that the total amount must be divided, in order to obtain the number returned as remaining in each month, by the number of years which the table embraces, by the number of the seasons, and of the months in each season. Thus, the number of years being five, of the seasons three, and of the months, in each, four, the 4,565 remaining in hospitals must be divided by five, to give the annual average, which is 913; by three, to give the average for each season, which is 304; and this last number by four, to give the average number, 76, for those cases of fever remaining in hospitals at the end of each month, when the returns are made up. The same explanation equally applies to all the other diseases.

The annual average effective strength of the Presidency division of the European army, it will be seen from the table, was 1727; but as it was necessary to add up the strength given with each return, as well as the numbers of admissions, &c. in order to calculate the averages and per-centages of admissions and deaths, the total strength standing in the tables opposite to the seasons is the effective strength multiplied by the number of the years which the table represents, and the grand total is these numbers added together. The whole will appear more clear when the abstract tables given in this section are compared with the more detailed ones contained in the Appendix.

ABSTRACT OF THE MEDICAL RETURNS OF THE PRESIDENCY DIVISION OF THE BENGAL EUROPEAN ARMY, FOR

A PERIOD OF FIVE YEARS, VIZ. FROM 1821 TO 1825 INCLUSIVE.

Seasons of Five Years.	Total Effective Strength of Five Years.	Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhoea.			Per-Centage of nominal Admissions in the Effective Strength.						Per-Centage of Deaths in the nominal Admissions.				
		Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	
Cold Season (Nov. Dec. Jan. and Feb.)	8437	56	35	6	1264	749	27	2645	1596	71	678	287	13	792	528	10	$\frac{3}{5}$	15	$31\frac{3}{8}$	8	$9\frac{2}{3}$	$10\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{5}{8}$	$1\frac{0}{10}$	$1\frac{1}{4}$	
Hot Season (March, April, May, and June.)	8768	193	109	40	909	429	53	4591	2775	73	897	338	26	741	473	5	$2\frac{1}{2}$	$10\frac{3}{8}$	$52\frac{2}{3}$	$10\frac{2}{7}$	$8\frac{4}{9}$	$2\frac{3}{4}$	$5\frac{4}{9}$	$1\frac{1}{8}$	$2\frac{10}{10}$	$\frac{3}{8}$	
Rainy Season (July, Aug. Sept. and Oct.)	8708	81	54	18	2013	980	108	6537	4622	171	795	339	21	1071	701	17	$\frac{10}{10}$	$23\frac{1}{4}$	$75\frac{1}{7}$	$9\frac{1}{7}$	$12\frac{1}{3}$	$22\frac{2}{3}$	$5\frac{1}{3}$	$2\frac{2}{8}$	$2\frac{3}{8}$	$1\frac{5}{8}$	
Grand Total for 5 Years	25913	330	198	64	4186	2158	188	13773	8893	315	2370	964	60	2604	1702	32	—	—	—	—	—	—	—	—	—	—	—
Annual Average	1727	66	39	13	837	431	37	2755	1779	63	474	193	12	521	340	6	4	$48\frac{1}{2}$	159	$27\frac{1}{2}$	30	$19\frac{2}{3}$	$4\frac{1}{2}$	$2\frac{2}{7}$	$2\frac{5}{8}$	$1\frac{5}{8}$	

* * The above Abstract Table, as well as those which follow, will be better understood by comparing it with the more detailed Table contained in the *Appendix*. It will be perceived, upon reference to the Table in the *Appendix*, that the admissions are increased by the circumstance of those remaining in hospital when the returns were made out being added to those admitted through the month. The admissions, as given, therefore, in the above Table, are *nominal* not *actual* admissions. (See the preceding page, and the note subjoined.)

These Tables shew that, although fevers are the most prevalent diseases, especially in some of the northern provinces of India, dysentery and hepatitis are the most frequently fatal. Upon this subject, however, more detailed observations will be offered in the Second Volume of the Work.

The districts of Jessore and the Hoogley are extremely low, are almost every where inundated during the rains, and covered by a thick jungle in many parts,—circumstances which readily account for the prevalence of fevers and dysentery. Diamond Harbour, in the district of the Hoogley, is extremely unhealthy, especially at the commencement of, and immediately after, the rainy season. This is owing to the proximity of low swampy shores, where animal and vegetable matters, in a state of decay, are continually deposited by the retiring tides to the sluggish streams which run into the Hoogley, floating down putrid vegetable and animal substances, and to the vicinity of salt marshes, lagoons, thick jungles, and woods abounding with the putrid bodies of myriads of insects and reptiles. Sagor Island, situated at the confluence of the Hoogley with the ocean, is an important station for ships, being less destructive to their crews than Diamond Harbour. Owing to the great expansion of the river at this island, ships have here the advantage of lying at a sufficient distance from the shore to escape the influence of the noxious exhalations from the mud banks of the river, and putrid substance covering them; and they here enjoy a free circulation of sea air.

Moorshedabad, the native capital of Bengal, is a large city, containing nearly 200,000 inhabitants. The streets are narrow and dirty, and, owing to the want of sewers and drains, nearly impassable after rains, emitting putrid and noxious exhalations. The town is built upon both sides of the Cossimbazar river, the most sacred branch of the Ganges, on a low and level soil, and is surrounded by a thick jungle, which extends itself amongst the houses of the outskirts of the city, and by stagnant pools and swamps. Owing to these causes, the town is unhealthy even to the native inhabitants.

Berhampoor, a town six miles south from Moorshedabad, is the station for European and native troops. The cantonments are commodious, and consist of a fine range of well-ventilated buildings, in the vicinity of the town, which is open, and more healthy than Moorshedabad. The following abstract of the table contained in the Appendix will shew the diseases most prevalent in a European brigade, whose annual average effective strength for four years was 957 men.

ABSTRACT OF THE MEDICAL RETURNS OF THE BERRHAMPORE DIVISION OF THE BENGAL EUROPEAN ARMY,

FOR

A PERIOD OF FOUR YEARS, VIZ. FROM 1821 TO 1824 INCLUSIVE.

Seasons of Four Years.	Total Effective Strength of Four Years.			Cholera.			Dysentery.			Fever.			Liver Diseases.			Diarrhoea.			Per-Centage of Nominal Admissions in the Effective Strength.					Per-Centage of Deaths upon Nominal Admissions.				
	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.			
Cold Season (Nov. Dec. Jan. Feb.)	4240	35	20	8	482	308	35	1390	902	64	111	53	8	168	125	2	$\frac{5}{8}$	$11\frac{3}{8}$	$32\frac{7}{9}$	$2\frac{3}{5}$	4	$22\frac{8}{9}$	$7\frac{2}{3}$	$4\frac{3}{5}$	$7\frac{1}{5}$	$1\frac{1}{3}$		
Hot Season (March, April, May, June.)	3363	35	20	11	200	105	18	520	331	13	155	79	5	220	146	5	$\frac{9}{10}$	6	$15\frac{1}{2}$	$4\frac{3}{5}$	$6\frac{5}{9}$	$31\frac{4}{9}$	9	21	$31\frac{3}{4}$	$2\frac{2}{9}$		
Rainy Season (July, August, Sept. Oct.)	3845	29	14	11	366	182	31	1447	816	87	164	76	6	285	204	7	$\frac{7}{9}$	$9\frac{3}{10}$	$37\frac{1}{10}$	$4\frac{2}{7}$	$7\frac{4}{9}$	$37\frac{9}{10}$	$8\frac{1}{2}$	6	$3\frac{2}{3}$	$2\frac{1}{2}$		
Grand Total for 4 Years..	11448	99	54	30	1048	595	84	3357	2049	164	430	208	19	673	475	14	—	—	—	—	—	—	—	—	—	—		
Annual Average . . .	954	25	13	7	262	149	21	839	512	41	107	52	5	168	119	$3\frac{1}{2}$	$1\frac{3}{4}$	$26\frac{1}{2}$	$11\frac{1}{2}$	18	30	8	$4\frac{9}{10}$	$4\frac{4}{9}$	2			

From this Table it will be seen that Fevers and Dysentery were most prevalent at this Station during the rainy and cold Seasons.

*** It should always be remembered, upon referring to the above Abstract, that the number of admissions is greatly increased in the monthly returns, from which this Table is constructed, by those remaining in hospital when the returns were made having been added to those admitted. The admissions, as given here, are, therefore, *nominal*—not *actual* admissions, as furnished in the returns published in our “ Sketches of the Diseases of India.” The *actual* admissions into hospital, during the period embraced by the above Abstract, would be more nearly approached, perhaps, by adding the number of those dismissed to the deaths; but then the transferred to other hospitals, &c. would be entirely omitted. For further explanations see p. 110 *et seq.* and the preceding Table.

Province of Bahar.—The seasons are nearly the same in this province as in Bengal. The country is more elevated, and its climate, in some respects, is superior to that of Bengal. The nights are generally much cooler; but it is more subject to great droughts and heat, and to parching winds from the west, during the warm season. The district of Bahar is generally level, but the adjoining districts are more hilly. In the northern districts of this province, blighting chills and frost are sometimes experienced during the cold season. Wheat is very generally cultivated. In proceeding north through this province, the race of men evidently improves, compared with the natives of Bengal, as regards their physical characters; the former being taller and more robust than the latter. This circumstance evidently shews an improvement in the climate. The district of Tirhoot, which occupies the north-western quarter of this province, and is situated to the north of the Great Ganges, is more elevated and healthier than the districts more to the south. The soil is also drier; but during the summer the heat is often intense. It is, however, plentifully supplied with water for agricultural purposes from several small rivers which run into the Ganges, and from tanks and reservoirs. On account of the soil and climate of this district, it has been selected by the British Government as an eligible country for the improvement of the breed of horses, the aboriginal race of the Bengal province being of a diminutive size. A low and marshy soil seems every where uncongenial to the horse; for he appears to degenerate in such places, even when he lives and propagates. In districts, in warm climates, which are more than usually low and marshy, the horse generally experiences the fate of Europeans: he either dies soon after he is brought to those places, or his progeny seldom reach maturity.

Dinapoor, a town situated on the south side of the Ganges, about ten miles west of Patna, the capital of the province of Bahar, is the principal military station. The barracks for European soldiers are most magnificent. The accommodations for the officers are complete, and the private soldiers have large and well-aired apartments. The grounds in the vicinity are well laid out, and studded with neat and commodious habitations. Notwithstanding those advantages, the situation of the town is by no means favourable to the health of Europeans. It is situated upon a neck of land formed by the

junction of the Sone and the Ganges rivers, and near to the banks of the latter. These rivers form, at this particular part, several muddy islands, overgrown by rank grass and jungle. There are also some swamps in the vicinity, which, together with the muddy banks of the rivers and the alluvial islands formed by their currents, may be considered as productive of malaria at the commencement of the rains, and during the cold and early part of the warm seasons. That dysentery should prevail here amongst the European troops more than fever, as the result of the circumstances of the locality, is most probably owing to the abundant means of intoxication which are here readily provided for the soldier, and which he fails not to avail himself of. We have generally observed that the use of intoxicating drinks, more than any other of the predisposing and determining causes of disease, is productive of dysentery. Some influence may also be allowed to the cold nights and raw dews which are experienced at Dinapore, and in those districts bordering the rivers which flow through this province, particularly during the latter months of the year.

The following Table, which is abstracted from the more detailed one contained in the Appendix, will shew the relative degree of disease and mortality which occurred amongst the European troops stationed in this province. From this Table it will be seen that fever and hepatitis were most prevalent during the hot and rainy seasons; and that dysentery and diarrhoea prevailed most during the hot season.

ABSTRACT OF THE MEDICAL RETURNS

OF

THE DINAPORE DIVISION OF THE BENGAL EUROPEAN ARMY,

FOR

A PERIOD OF FOUR YEARS, VIZ. FROM 1821 TO 1824 INCLUSIVE.

Seasons of Four Years.	Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhoea.			Per-Centage of Nominal Admissions in the Effective Strength.					Per-Centage of Deaths upon Nominal Admissions.					
	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	
Cold Season	34	19	2	801	390	61	607	394	20	115	50	6	169	107	—	$\frac{9}{10}$	21	$15\frac{2}{3}$	3	$4\frac{1}{2}$	6	$7\frac{5}{8}$	$31\frac{1}{2}$	$51\frac{1}{2}$	—	
Hot Ditto	54	25	17	1179	617	82	1301	789	20	300	131	7	383	250	—	$1\frac{9}{10}$	$33\frac{1}{2}$	37	$8\frac{1}{2}$	$10\frac{9}{10}$	$31\frac{1}{2}$	7	$1\frac{1}{2}$	$2\frac{1}{2}$	—	
Rainy Ditto	36	16	12	966	495	86	2018	1334	48	272	128	14	204	151	2	$\frac{9}{10}$	$25\frac{1}{2}$	$53\frac{1}{9}$	$7\frac{1}{2}$	$1\frac{1}{5}$	$33\frac{1}{2}$	$8\frac{9}{10}$	$2\frac{1}{2}$	$5\frac{1}{2}$	1	
Grand Total for Four Years . .	124	60	31	2946	1502	229	3926	2517	88	687	309	27	756	508	2	—	—	—	—	—	—	—	—	—	—	—
Or Annual Average	25	12	$6\frac{1}{5}$	589	$300\frac{1}{2}$	46	785	$503\frac{1}{2}$	$17\frac{1}{2}$	$137\frac{1}{2}$	62	$5\frac{1}{2}$	151	$101\frac{1}{2}$	—	$3\frac{3}{10}$	79	$105\frac{2}{3}$	$18\frac{2}{3}$	$20\frac{1}{2}$	25	8	$2\frac{1}{2}$	4	$\frac{1}{4}$	

For various explanations relating to the above Table, see p. 110 et seq. and the preceding Tables.

The Province of Allahabad.—That part of this province which is adjacent to the Ganges and Jumna rivers is low and very productive; but its western parts, particularly the Bundelcund territory, are elevated and diversified with high hills. Between these two divisions there is considerable difference of climate, the former being sultry and subject to hot winds, from which the latter is exempt. The city of Allahabad may be considered as healthy. The ground on which it stands is but little elevated above the level of the Ganges and Jumna: it is free from marshes and jungles in its immediate vicinity.*

* The country surrounding Allahabad is low. Large embankments have been raised along the right bank of the Ganges, to prevent the river, during its height, from overflowing the neighbouring flat country. The cantonment is situated about two miles to the north on the banks of the Ganges, and occupies a large tract of ground. The Bungalows neither seem good, nor are the grounds well laid out. The roads through the cantonments are bad. Very few of the officers live in the fort, but chiefly in the cantonments. There is a fine hospital belonging to the garrison, situated about three quarters of a mile to the westward of the fort on the banks of the Jumna. The heat at Allahabad is often excessive, and disease is very prevalent after the rains.

For the following Report we are indebted to Dr. Badenoch, a scientific and zealous officer, who has served long in India:—

“ The flank battalion, consisting of five companies, left Dinapore the 27th July, 1816, and proceeded up the river to Allahabad, where we arrived on the 21st August, and marched into the fort, the sick amounting at that time to 20 men—a very small proportion. Most of the cases were slight. On the 24th sickness began to increase.

“ *September 4th.*—During the middle part of the day the sun is very powerful; but the morning, evening, and nights, are cool and agreeable, a fine fresh breeze blowing from the west and north-west. The temperature at sun-rise is about 80; and at 3 P.M. 89. There has been no rain for ten days, but the country is green and fresh. The river has fallen very much, probably upwards of twelve feet. I imagine that the fall and rise of the river materially affect the health of the garrison. Along the Jumna face of the fort, owing to the falling of the water of the river, much slime and filth are already left under the walls; which being acted upon by the sun, must produce noxious exhalations. The same, in a less degree, takes place on the Ganges side. There are at present in hospital 64 men, nearly one third of them with dysentery, in various forms and degrees.

“ *October 5th.*—Since the 4th September, I have not been able to write a line, or to do any thing else than attend to our numerous sick, which have progressively increased to 170, a number truly alarming.

“ *October 20th.*—In order to remove the troops from some of the causes of the prevailing sickness, it was recommended by Mr. Gibson and myself to leave the barracks in the fort, and to encamp them near the cantonment of Allahabad. The battalion moved into tents, (three miles north

Although formerly possessed of much magnificence, as is still evident from the remains, this city now consists chiefly of filthy huts, intermingled here and there with a stone or brick-built house. The fort at Allahabad is strong and spacious, and the apartments allotted to both officers and men are large and well ventilated. Owing to its situation, however, upon the neck of land formed by the junction of the Jumna with the Ganges, the diseases of the country are occasionally very prevalent amongst the troops. The exhalations

of the fort) on the morning of the 11th. The sick, amounting to one third of the whole number, moved into camp on the evening of the 12th and morning of the 13th, *i. e.* a week ago. I can have no hesitation in saying that the change has been beneficial. For the first few days the men continued to be taken ill to the number of 15 to 20 daily; but for the two days now past, only a third of that number has been admitted, and those are generally men with intermittents of the tertian type. Nearly half the men in hospital may be said to be convalescent, and at present there are not more than six cases attended with danger. Since the 6th we have lost 11 men. During the month, 19 men have died, 17 of them in fever."

This fully exemplifies what we have already stated when treating of the sources of malaria, the danger of encamping, building garrisons, or having forts or cantonments, on the low and muddy banks of rivers, in warm climates. We subjoin Dr. Badenoch's account of the weather at this season :—

" STATE OF THE WEATHER.

" Rain on the 21st, 22d, 23d, and 24th August; temperature moderate; thermometer about 80° at sunrise, and 85° 3 P.M.

" *September 4th.*—The middle part of the day the sun is very powerful, but the mornings, evenings, and nights, are cool and agreeable; thermometer, at sunrise, 80°; at 3 P.M. 89°; no rain since the 24th; rain on the 8th, 19th, 20th, 26th, and 30th; winds north-east, east, and south-east, blowing strong; the river very high on the 28th and 30th.

October.—Winds variable during the month, but chiefly westerly and strong; atmosphere clear and pleasant; thermometer ranging from 64° to 78° at sunrise, and from 81° to 92° at 3 P.M.

" *November.*—Wind and weather very similar to the last month; thermometer ranging from 52° to 65° early in the morning, and from 75° to 77° in the afternoon.

" *December.*—Winds from the eastward on the 3d, and continued to the 12th warmer than when the wind was westerly; on the 13th the wind shifted to the west and north-west, and continued so till the end of the month, blowing fresh and cold; thermometer from 46° to 60° at sunrise, and from 72° to 81° at 3 P.M.

" *January.*—Winds first part easterly, then to the north-west; and, with the exception of the 21st, 22d, and 23d, which was easterly, the remainder of the month was west and north-west; thermometer, early in the morning, from 48° to 58°, and in the afternoon, from 70° to 79°."

from the soil of the banks of these rivers, and from the dirty and close streets of the city, and the crowded bazaars, are causes which have a greater or less influence upon the health of Europeans, according as they are more or less noxious or concentrated—states which will depend upon the character of the seasons, and circumstances not always cognizable to the senses.

Gazipoor.—The cantonments at Gazipoor are situated on the right bank of the Ganges, and the parade ground and bungalows extend to the edge of the river. The cantonments consist of bungalows for the officers and ranges of barracks for the soldiers. The whole has a good appearance; but there is a great want of good roads. Owing to the absence of drains, a heavy shower almost inundates the whole vicinity and parade grounds. The country is flat, rich, and productive, with scarcely a rising ground: hence it is subject to inundations of the river, and is productive of malaria after the rains. European soldiers are generally here much addicted to inebriety, owing to the facilities they have of procuring intoxicating liquors: a circumstance which tends much to increase sickness amongst them.

Benares, the seat of Brahminical learning, and the principal military and civil station in this province, is a large and magnificent city, containing upwards of 600,000 inhabitants. The cantonments, which are extensive, are four or five miles distant from the city. The country around is dry and the soil parched. Fever and dysentery are most prevalent during the months of October, November, and December, owing to the inundations from the previous rains and the cold nights. The subjoined abstract will shew the prevailing diseases, with the rate of mortality, amongst the European troops stationed here. It will be seen that fevers are most prevalent during the rainy season. From this Table it is evident that this is one of the most healthy stations under the Bengal Presidency.

ABSTRACT OF THE MEDICAL RETURNS

OF

THE BENARES DIVISION OF THE BENGAL EUROPEAN ARMY,

FOR

A PERIOD OF FIVE YEARS, VIZ. FROM 1821 TO 1825 INCLUSIVE.

Seasons of Five Years.	Total Effective Strength of Five Years.			Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhœa.			Per-Centage of Nominal Admissions in the Effective Strength.					Per-Centage of Deaths upon Nominal Admissions.											
	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.							
Cold Season . . . (Nov. Dec. Jan. Feb.)	8	3	4	255	139	14	801	527	21	187	74	5	134	91	1	—	4 $\frac{2}{5}$	14 $\frac{3}{8}$	3 $\frac{1}{4}$	2 $\frac{1}{3}$	50	5 $\frac{1}{5}$	2 $\frac{4}{5}$	2 $\frac{2}{3}$	7 $\frac{1}{6}$	13 $\frac{1}{6}$	4 $\frac{5}{9}$	1 $\frac{2}{7}$	2 $\frac{2}{3}$	2	4 $\frac{2}{3}$	29	4 $\frac{2}{3}$	1	
Hot Season . . . (March, April, May, June.)	38	23	5	250	141	12	903	594	14	291	122	2	196	140	1	2 $\frac{2}{3}$	4 $\frac{4}{9}$	16 $\frac{1}{8}$	5 $\frac{1}{5}$	3 $\frac{1}{2}$	13 $\frac{1}{6}$	4 $\frac{5}{9}$	1 $\frac{2}{7}$	2 $\frac{2}{3}$	13 $\frac{1}{6}$	4 $\frac{5}{9}$	1 $\frac{2}{7}$	2 $\frac{2}{3}$	2	4 $\frac{2}{3}$	2	4 $\frac{2}{3}$	1		
Rainy Season . . . (July, Aug. Sept. Oct.)	19	12	3	458	242	19	1721	1200	30	193	79	7	214	145	3	3 $\frac{3}{8}$	8 $\frac{7}{10}$	32 $\frac{7}{10}$	3 $\frac{3}{8}$	4	15 $\frac{5}{6}$	4 $\frac{1}{7}$	1 $\frac{2}{7}$	3 $\frac{2}{3}$	15 $\frac{5}{6}$	4 $\frac{1}{7}$	1 $\frac{2}{7}$	3 $\frac{2}{3}$	2	4 $\frac{2}{3}$	2	4 $\frac{2}{3}$	1		
Grand Total for 5 Years	65	38	12	963	522	45	3425	2321	65	671	275	14	544	376	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual Average . .	13	7 $\frac{1}{2}$	2 $\frac{1}{2}$	192 $\frac{3}{8}$	104 $\frac{1}{2}$	9	685	464	13	134	55	2 $\frac{4}{5}$	109	75	1	1	17 $\frac{2}{3}$	63 $\frac{1}{3}$	12	9 $\frac{3}{4}$	29	4 $\frac{2}{3}$	2	2 $\frac{4}{5}$	2 $\frac{2}{3}$	7 $\frac{1}{6}$	13 $\frac{1}{6}$	4 $\frac{5}{9}$	1 $\frac{2}{7}$	2	4 $\frac{2}{3}$	2	4 $\frac{2}{3}$	1	

*** For various explanations relating to the above Abstract, see p. 110 et seq. and the first and second Tables.

The *District of Cawnpoor* forms the north-west quarter of the province of Allahabad. In this district, particularly in the vicinity of the town and camp, are extensively cultivated Indian corn, wheat, barley, turnips, cabbages, and European vegetables; and grapes, peaches, and a variety of fruit, are to be found in the gardens of the officers.

The town of Cawnpoor is large, and is one of the principal military stations in the upper provinces. The officers' cantonments extend for nearly a space of six miles along the Ganges. During the dry season great annoyance is experienced from the dust. From the middle of October to the middle of June there is seldom a shower of rain. It will be perceived from the medical returns given in a Table in the Appendix, and from the abstract which follows, that fever, dysentery, hepatitis, and diarrhœa, are very prevalent during the rainy and hot seasons, more particularly during the former. Notwithstanding that the number of admissions is much greater in appearance than in reality, as already explained with respect to the preceding Tables, yet Cawnpoor must be considered as one of the most unhealthy stations in the Bengal Presidency. The per-centage of deaths in admissions is, however, very low: but, as also stated with regard to the foregoing Tables, it is lower in appearance than in reality, the per-centage having been calculated from the *nominal* admissions, no means of ascertaining the *actual* admissions having come within our reach.

ABSTRACT OF THE MEDICAL RETURNS

OF

THE CAWNPOOR DIVISION OF THE BENGAL EUROPEAN ARMY,

FOR

A PERIOD OF FIVE YEARS, VIZ. FROM 1821 TO 1825 INCLUSIVE.

Seasons of Five Years.	Total Effective Strength of Five Years.			Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhœa.			Per-Centage of Admissions in the Effective Strength.					Per-Centage of Deaths in Admissions.					
	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.	
Cold Season (Nov. Dec. Jan. Feb.)	8	6	2	587	342	20	1831	1253	34	246	112	11	350	221	9	6 $\frac{3}{11}$	20	2 $\frac{2}{3}$	3 $\frac{4}{25}$	25	3 $\frac{2}{8}$	1 $\frac{8}{19}$	4 $\frac{4}{25}$	25	3 $\frac{2}{8}$	1 $\frac{8}{19}$	4 $\frac{4}{25}$	25 $\frac{5}{9}$	
Hot Season (March, April, May, June.)	153	72	27	837	424	38	2924	1851	52	441	161	5	521	382	3	9 $\frac{1}{17}$	33 $\frac{5}{9}$	4 $\frac{4}{9}$	18	4 $\frac{1}{2}$	1 $\frac{7}{9}$	1 $\frac{1}{17}$	18	4 $\frac{1}{2}$	1 $\frac{7}{9}$	1 $\frac{1}{17}$	5 $\frac{6}{13}$		
Rainy Season (July, Aug. Sept. Oct.)	135	66	38	1497	815	53	5528	3947	58	528	253	17	804	553	12	1 $\frac{2}{5}$	15 $\frac{2}{3}$	57 $\frac{3}{5}$	28 $\frac{1}{7}$	3 $\frac{6}{5}$	1	3 $\frac{2}{5}$	28 $\frac{1}{7}$	3 $\frac{6}{5}$	1	3 $\frac{2}{5}$	1 $\frac{10}{16}$		
Grand Total for 5 Years	296	144	67	2921	1581	111	10283	7051	144	1215	526	33	1675	1156	24	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual Average	59 $\frac{1}{2}$	29	13 $\frac{1}{2}$	584	316	22	2056 $\frac{1}{2}$	1410	28	243	105	6 $\frac{3}{2}$	335	231	5	3	32	110	13	18	23	4	1 $\frac{1}{2}$	3	4	1 $\frac{1}{2}$	3	1 $\frac{1}{2}$	

*** See the explanations accompanying the preceding Tables, and at page 110.

The Province of Oude is generally level and well cultivated, with the exception of the district of Gorucpoor. The province is, upon the whole, healthy, except in the vicinity of jungles and cotton fields. The district of Gorucpoor is bounded on the north by ranges of lofty mountains. The country, in a southerly direction from the base of these mountains, is flat, and covered by woods and jungles, and intersected by numerous rivers and streams: indeed, the whole district, from the town of Gorucpoor to the base of the mountains, is one continued forest. Easterly winds prevail generally throughout the whole year. The climate of this district is by no means healthy, owing to the great extent of jungle, stagnant water, and marshes, over which the easterly winds pass before they reach the more inhabited parts of the country. Fevers, occasioned by the great extent of jungle and low and marshy ground, are most prevalent and dangerous in the months of May and June. They generally run their course rapidly. The natives usually ascribe those fevers to the noxious qualities of the water; and they may be partly right in their inference. The chief agent, however, most undoubtedly is the malaria generated from the moist and absorbent soil, and from the jungles, marshes, and woods, in the low grounds at the foot of the Nepaul mountains.

The Province of Agra is in general flat and open; but to the south of the Chumbul river, and towards its western frontier, it is more hilly and jungly. The climate is temperate throughout the greater part of the year; but while the hot winds of the warm season prevail, like the other central provinces of India, the heat is intense and the climate unhealthy, particularly in the hilly and jungly districts. The natives are a robust race. Agra, once the chief city in this province, is still a considerable place. It is protected by a very large and strong fort, considerably elevated above, and overlooking, the Jumna river, which is here nearly half a mile broad. The town is healthy, excepting during the hot winds, which have been already alluded to.

Furruckabad, the capital of a district of the same name in this province, is one of the principal cities of Upper Hindostan. It stands a short distance

from the western banks of the Ganges, in lat. $27\frac{1}{2}^{\circ}$ N. and $79\frac{1}{2}^{\circ}$ E. long. Futtehgur, a town almost joined to the city of Furruckabad, is the head quarters of a brigade of troops. The station is tolerably healthy.

The Province of Delhi enjoys, upon the whole, a temperate climate, excepting during the warm season, when hot winds occur. The north west quarter of the province is much overgrown with trees and thick jungle, and is, consequently, unhealthy, especially during the hot and rainy seasons. The south-west quarter is free from jungle, and its soil is dry and fertile. The centre of the province is level, and well watered by the Ganges, the Jumna, and Ramgunga rivers, and the streams which contribute to them. The district of Moradabad, particularly that part of it which is at the base of the Gurhwal hills, is unhealthy, owing to the woods and jungles by which it is covered in many places. The Saharunpoor district, forming the north part of this province, consists generally of flat ground, about 1100 feet above the level of the sea. The country is fertile and healthy. The towns of Saharunpoor, Hurdwar, and Kurnal, enjoy an elevation of about 1050 feet above the sea.

Meerut, the principal town in the district of the same name, is situate in lat. 29° , and long. $77^{\circ} 38'$, and is the principal military station in the upper provinces, and is also the seat of a court of justice. Many parts of the adjoining country is covered by jungle. Cotton is generally cultivated.*

* Meerut lies between the Ganges and Jumna rivers, and about an equal distance from each. It is situated on a sandy soil and flat country, with a little declination to the south, barely sufficient to carry off the heavy rains into the Kallee Nuddee, a small nullah on the eastward, emptying itself into the Ganges. Though the soil is sandy, it is covered with grass all the year round, which even in the wet season is prevented running into jungle, by the numerous heads of cattle spread over it. The city is walled, and contains about 30,000 inhabitants. The European cantonments are situated two miles to the north of the city, on an extensive plain. The native lines are one mile from the city, fronting the west. There are barracks for three complete European regiments. The officers' bungalows are in the rear of their respective lines, and laid out with the same regularity as if in camp. This is the head quarters of the second division of the field army, and the residence of a major-general.

Meerut is 75 miles to the southward of the first range of hills, which rise abruptly from the

From the following Table, which contains an abstract of that contained in the Appendix, it will be seen that all the endemic diseases of the country, particularly fever, are most frequent in the rainy and hot seasons. The percentage of disease in the effective strength is, upon the whole, low. This station is one of the most healthy in India.

plains of Hindustan, and about 108 from the Himala, or snowy mountains, which divide India from Tartary. It is the most northerly station for King's troops in India. The mountains are visible from Meerut on every clear day. The seasons are the same as in the northern provinces of Bengal. During May the westerly or hot winds, which blow over all these provinces, are in full force, and the thermometer then rises above 90.

“The climate is so favourable that it produces nearly all the vegetables and fruits of Europe, as well as those of the tropics; and the same fields which in the cool season are covered with crops of wheat, are, in the wet, bearing sugar-cane, indigo, and cotton.” There are a few small swamps or snipe jheels, but not near or considerable enough to affect the health of the station. The prevailing winds throughout the year are westerly.

During the hot and wet seasons, fevers, dysentery, and hepatitis, are the prevailing diseases. The fever is generally ardent, requiring depletions, &c. It seldom degenerates into the intermittent type. This is also the case with the fevers of the Carnatic; and may be considered in some respects singular, because the fevers of the lower provinces of Bengal, of Mysore, Hyderabad, Nagpoor, Wynad, and the northern Circars, very frequently terminate in intermittents. Does this difference in the disease arise from some peculiarity in the endemic causes, or in the manner of treatment during the early stages? We are inclined to attribute it to the former chiefly, although the latter may also have some influence. Dysentery is generally intractable, and a fatal disease, especially amongst the European soldiers; a circumstance arising chiefly from the facilities they possess of procuring spirituous liquors.

Mr. Jackson strongly recommends Meerut as a convalescent station, and as a place of residence for those old Indians who, in their habits and constitution, by long residence, have become naturalized to India, and estranged from their own country. The society is extensive, and the roads good. As a station for troops, it is well situated and healthy. Mr. Jackson states, that during the last three years, His Majesty's 14th regiment has lost only twenty men per annum, although a very strong corps; its strength being 1120 men. The officers are always much more healthy than the men, disease being in a great measure the result of inebriety.—(See Mr. JACKSON *on the Topography of Meerut, in the Transactions of the Medical Society of Calcutta*, vol. i.)

ABSTRACT OF THE MEDICAL RETURNS

OF

THE MEERUT DIVISION OF THE BENGAL EUROPEAN ARMY,

FOR

A PERIOD OF FIVE YEARS, VIZ. FROM 1821 TO 1825 INCLUSIVE.

Seasons of Four Years.	Total Effective Strength of Five Years.	Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhœa.			Per-Centage of Admissions in the Effective Strength.					Per-Centage of Deaths in Admissions.					
		Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.	
Cold Season . . . (Nov. Dec. Jan. Feb.)	10175	7	3	2	851	497	19	1047	673	14	304	115	8	130	74	3	$\frac{1}{1\frac{1}{2}}$	$8\frac{1}{3}$	$10\frac{1}{3}$	3	$1\frac{1}{4}$	$28\frac{4}{7}$	$22\frac{2}{9}$	$1\frac{1}{3}$	$22\frac{2}{3}$	$21\frac{1}{4}$	
Hot Season . . . (March, April, May, June.)	10498	44	24	7	992	525	21	1723	1001	21	477	172	5	240	126	3	$\frac{4}{9}$	$9\frac{1}{2}$	$16\frac{1}{9}$	$4\frac{1}{2}$	$2\frac{1}{2}$	16	$2\frac{1}{9}$	$1\frac{1}{5}$	1	$1\frac{1}{4}$	
Rainy Season . . . (July, Aug. Sept. Oct.)	10298	37	21	5	1407	796	38	2637	1603	52	613	226	11	344	198	6	$\frac{2}{3}$	$13\frac{2}{3}$	$25\frac{1}{3}$	6	$3\frac{1}{2}$	$13\frac{1}{2}$	$27\frac{7}{10}$	2	$1\frac{4}{5}$	$17\frac{1}{2}$	
Grand Total for 5 Years	30971	88	48	14	3250	1818	78	5407	3277	87	1394	513	24	714	398	12	—	—	—	—	—	—	—	—	—	—	—
Annual Average . .	2065	$17\frac{5}{8}$	$9\frac{3}{8}$	$2\frac{5}{8}$	650	$363\frac{1}{2}$	$15\frac{3}{8}$	$1081\frac{2}{3}$	$655\frac{2}{3}$	$17\frac{7}{8}$	279	$102\frac{3}{8}$	5	143	$79\frac{3}{8}$	$2\frac{3}{8}$	$\frac{2}{3}$	31	52	13	7	18	$2\frac{3}{8}$	2	2	$1\frac{3}{8}$	

* * * See the explanations accompanying the first and second Tables, and at page 110.

Malwa and Central India.—Malwa proper has been described by Sir John Malcolm, in his excellent work on Central India, “as a table land, in general open and highly cultivated, varied with small conical and table-crowned hills and low ridges, watered by numerous rivers and small streams, and favoured with a rich productive soil and a mild climate.” *

The temperature of Malwa, owing to its elevation above the level of the sea, which varies, according to barometrical observations, from 1000 to upwards of 2000 feet, is in general mild. The range of the thermometer is small, except at the latter part of the year, when great and sudden changes often take place. The climate, on the whole, may be considered as salubrious, and to those enervated by a long residence in the lower and warmer plains of India, it may be recommended as pleasant and invigorating. During the two months, however, immediately succeeding the rainy season, fevers prevail here, as in other parts of India. At this season the hilly and woody parts should be avoided. The seasons are those common to western India, and may be distinguished as we have those of the rest of Hindustan. The fall of rain during June, July, August, and September, is in general mild and regular. The quantity which falls during those months has been calculated by Sir John Malcolm at about 50 inches. “During this season,” this eminent writer remarks, “the range of the thermometer is exceedingly small, seldom falling lower than 72°, night and morning, or rising higher than 76° or 77° at

* “Malwa in only a few places attains a greater height above the level of the sea than 2000 feet; yet, from the uniform nature of the country through which the rivers that rise in this province find their way to the ocean, and the little variation in their banks, we shall probably not err much in assigning to its plain a greater elevation than most parts between the northern mountains of Hindostan and the Nerbudda. Excepting to the north-west, there is a rise towards the province of Malwa from all quarters: to the south it is elevated 1700 feet above the valley of the Nerbudda or Nemaour; and this occurs in a very short distance, from the abrupt ascent of the Vindhya mountains, which have little declivity towards the north. Though less strongly marked to the east and west, there is an equally well-indicated ascent over the hilly tracts (branches of the Vindhya) which on the east pass Bhopal, and on the west divide this province from Guzerat and Mewar. To the north-west there is an ascent to Mewar at the Chittore range, which is about 200 feet high; but as the plain of Malwa declines to this point more than that amount, and the country beyond it, or west of it, begins again to descend, none, perhaps, but the highest lands of Mewar can be considered on a level with the southern parts of Malwa.”—Sir JOHN MALCOLM *on Central India*.

noon. Though the mornings become cooler soon after the close of the rainy season, there is no very cold weather till the month of December: it continues all January and part of February. In the latter month, in 1820, the thermometer stood, at six o'clock in the morning, at 28°. During the hot season which succeeds, the parching winds from the northward and westward that prevail in most parts of India to an intense degree, are here comparatively mild and of short duration. The thermometer, however, during the day rises sometimes as high as 98°; but the nights are invariably cool and refreshing." The soil of Malwa is not deep, but it is celebrated for its fertility. It mostly consists of a rich black mould and of a rich dark loam, and in many places of a ferrugineous earth. In situations where the soil is deep, it becomes miry and almost impassable during the rains; and during the hot season it dries up and opens into deep and wide clefts and chasms. Cotton, tobacco, indigo, and opium, are generally cultivated, and all kinds of grain, fruits, and vegetables.

The prevailing complaints among the natives of Malwa are fevers and enlargements of the spleen, cholera, and dysentery: ailments partly owing to the nature of the soil, and the cotton and tobacco cultivation, &c. in which many of them are engaged. The natives are robust and clean in their persons.

The small *Province of Bagur* consists of a hilly tract, situated between Malwa and Guzerat. Owing to its extensive and thick forests, fevers of a malignant nature are prevalent during two or three months following the rains. The climate can, at no period, be considered as salubrious. The hilly district of *Harrowtee*, which is connected with the north-east extremity of Malwa, and the hilly country which forms the eastern boundary of the table land of Malwa, and divides that province from Bundelcund, are all more wooded and more jungly than Malwa, and, consequently, more unhealthy. The soil is black and fertile in the cultivated valleys. From the following abstract it will be perceived that fever and dysentery were the prevailing diseases amongst the European troops, and that they were most prevalent during the rainy season. Owing to this province being a recent acquisition, the accommodations for the troops are yet incomplete. To this circumstance is in some degree owing the high per-centage of disease in the returns.

ABSTRACT OF THE MEDICAL RETURNS

OF

FOR

THE MALWA DIVISION OF THE BENGAL EUROPEAN ARMY,

A PERIOD OF FOUR YEARS, VIZ. FROM 1821 TO 1824 INCLUSIVE.

Seasons of Four Years.	Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhoea.			Per-Centage of Admissions in the Effective Strength.					Per-Centage of Deaths upon Admissions.				
	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.			
<i>Total Effective Strength of Four Years.</i>																									
Cold Season..... (Nov. Dec. Jan. Feb.)	912	2	2	—	110	51	9	278	169	9	29	17	—	23	10	3	2½	—	8½	3¼	—	13			
Hot Season (March, April, May, June)	1017	—	—	—	78	45	4	362	212	7	24	11	1	23	8	—	2	—	5½	19 10	4½	—			
Rainy Season (July, Aug. Sept. Oct.)	1036	4	4	—	186	112	7	563	291	28	23	7	3	43	23	1	4½	—	3¾	5	13	2½			
Grand Total for Four Years ..	2965	6	6	—	374	208	20	1203	672	44	76	35	4	89	41	4	—	—	—	—	—	—			
Annual Average	247	1½	1½	—	93¾	52	5	300¾	168	11	19	9	1	22½	10½	1	9	—	5½	3½	5½	4½			

** See the explanatory notes accompanying the first and second Tables, and at page 110.

Province of Gundwana. — That part of this province which intervenes between Bengal, Orissa, and Nagpoor, is generally a rugged and mountainous country, overrun by jungle, and, until lately, but little known to Europeans. Indeed, a large proportion of it is mountainous, poor, ill watered, thinly inhabited, covered with wood and jungle, and unhealthy. It, however, contains many fertile and well cultivated plains. The mountainous districts are inhabited by the native Gonds, having been driven by their invaders from the plains to the unwholesome fastnesses of the more elevated regions. The air of the plains on the sea coast is considered as unhealthy to them as that of the hills is to the inhabitants of the plains, and to Europeans. The range of the thermometer in the district of Sirgoojah and the higher country of the province is said to be upwards of 70, in the 24 hours during the rainy season. The temperature is generally from 76 to 98 in the hot season, and from 38 to 70 in the cold season.

Sumbhulpoor, a district of Gundwana, like the rest of that province, is unhealthy, owing to the wooded and jungly state of its rich and loamy soil, and the height of its hills, and its deep valleys and ravines. The seasons are nearly those of Bengal, but the extremes of heat and cold are greater, and their vicissitudes more sudden. The range of the thermometer is nearly the same in this district as in Sirgoojah.

In the northern and eastern parts of the province of Gundwana, chains of mountains, running in an easterly and westerly direction, rise to about 6000 feet above the level of the sea: these are intersected by valleys of various extent. The Great Valley of Sumbhulpoor is not above 500 feet above the level of the sea, at its lowest part. The ravines and valleys are much covered with jungle. Swamps are common in all the districts of the province till the month of April, when they dry up. Lagoons and jheels are also numerous, and are covered with aquatic plants, which decay during the dry months of April and May, when the lagoons become dry. The nights during the cold season are attended with dews, and are often damp and chilly. The most prevalent wind in the dry season, from October to June, is the south-west. North-east winds prevail during the rainy season. About ten days after the

rains have set in, noxious effluvia begin to arise, particularly in low places and where the air is confined by thick jungle and woods, and in the vicinity of stagnant pools, in which vegetable substances and impurities, carried from the high grounds, gradually putrefy. The healthy season of the year may be said to be from December to the commencement of the rains; and the unhealthy season, during their continuance till some time after their termination. In the mountainous districts of this part of India, the most unhealthy months are September, October, and November. In these districts, bilious remittent fever and dysentery are the prevailing diseases amongst Europeans; and intermittents, ulcers on the lower extremities, diarrhoea, and rheumatism, among the sepoys and natives.

Nagpoor, the capital of the Gundwana province, is extensive and populous, containing upwards of 100,000 inhabitants. The streets are narrow and filthy. It is situate in a plain, and is about 1000 feet above the level of the sea, and is open on all sides, except the west, where there is a low range of tabular trap hills. The soil consists of a black earth. Cotton is extensively cultivated. The general character of the whole country for many miles around Nagpoor is very much alike. The country is considerably elevated, particularly the parts nearest to Malwa; and there is a gradual descent thence to the sea coast of Orissa and the Northern Circars. The soil is black and stony, covered with scattered jungle, and in some parts with excessively long grass. The jungles and grass are generally, through the night and morning, covered with dew, the evaporation of which makes the cold considerable, particularly in the morning. The seasons are similar to those of Central India. The nights and mornings are generally cool throughout the year, and the variation of temperature is very great. From November to February the thermometer ranges from 50 to 90, and sometimes it rises above 100.

The prevailing diseases, as will be seen from the adjoining abstract, and from the Table in the "Sketches of the Diseases of India," are fever and dysentery, particularly the former. During the years 1816, 17, 18, 19, and 20, the cases of fever averaged annually 82 per cent in the effective strength

of Europeans and 51 per cent of the Seapoys; but this high per-centage of disease arose from the greater exposure of part of the force whilst on service, particularly from marching during the mornings and evenings, when the exhalations from the jungle, and the evaporation of dew from the long rank grass so abundantly covering the country, rendered the air cold and unwholesome. During the years embraced by the following abstract the per-centage of fever is much less than in the former years. This is chiefly owing to the troops having been stationary in the most open and healthiest parts of the country. Fevers are the endemic of Nagpoor and the adjoining districts. Hepatitis is, upon the whole, less frequent here than in most other stations in India; and dysentery, although prevalent, is as much to be imputed to the habits and indulgences of European soldiers as to the climate.

With respect to the character of the endemic of this province, it may be said to vary with the seasons, and to require different modes of treatment. In the cold season, although there is great pain in the head, and other inflammatory symptoms, blood-letting is not so beneficial as it is under similar circumstances in other parts of India, or in this country during the hot season.

During the rains, and for some time afterwards, the fevers are purely intermittent. As the air becomes drier and colder the remittent type is most frequent; and during the hot season they assume the continued type, and are oftener accompanied with disorder of the abdominal viscera. In the fevers which occur during the rainy season, and early part of the cold season, bark is absolutely requisite to their cure, purgation being at the same time properly attended to. During the hot season, blood-letting and other active evacuations are required.*

* See Sketches of the Diseases in India, p. 336—8.

ABSTRACT OF THE MEDICAL RETURNS
OF
THE NAGPOOR DIVISION OF THE BENGAL EUROPEAN ARMY,

FOR
A PERIOD OF THREE YEARS, VIZ. FROM 1822 TO 1824 INCLUSIVE.

Seasons of Three Years.	Total Effective Strength of Three Years.			Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhœa.			Per-Centage of Admissions in the Effective Strength.					Per-Centage of Deaths upon Admissions.				
	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.			
Cold Season (Nov. Dec. Jan. Feb.)	8947	6	4	1	134	81	5	574	405	8	44	23	3	31	26	-	$\frac{1}{15}$	$\frac{1}{2}$	$\frac{63}{7}$	$\frac{1}{2}$	$\frac{1}{5}$	$16\frac{2}{3}$	$37\frac{1}{2}$	$1\frac{3}{8}$	$6\frac{7}{8}$	—		
Hot Season (March, April, May, June.)	12696	16	5	9	209	133	6	1757	1317	11	78	30	2	85	56	1	$\frac{1}{8}$	$\frac{12}{3}$	$\frac{151}{3}$	$\frac{3}{5}$	$\frac{2}{5}$	$56\frac{1}{4}$	$28\frac{2}{3}$	$\frac{2}{5}$	$25\frac{2}{3}$	$1\frac{1}{6}$		
Rainy Season (July, August, Sept. Oct.)	12153	12	5	5	439	258	28	2012	1331	59	150	62	11	94	65	2	$\frac{1}{10}$	$3\frac{2}{3}$	$16\frac{2}{3}$	$1\frac{1}{3}$	$7\frac{2}{3}$	$41\frac{2}{3}$	63	$21\frac{9}{10}$	$7\frac{1}{3}$	2		
Grand Total for 3 Years..	33796	34	14	15	782	472	39	4343	3053	78	272	115	16	210	147	3	—	—	—	—	—	—	—	—	—	—	—	
Annual Average . . .	3755	$11\frac{1}{3}$	$4\frac{2}{3}$	5	$260\frac{2}{3}$	$157\frac{1}{3}$	13	$1447\frac{2}{3}$	$1014\frac{1}{3}$	26	$90\frac{2}{3}$	$38\frac{1}{3}$	$5\frac{1}{3}$	70	49	1	$\frac{1}{3}$	7	38	$21\frac{1}{3}$	2	44	5	2	6	$1\frac{1}{2}$		

* * * The nominal admissions, and their per-centage in the effective strength, are lower than they otherwise would have been, owing to the returns for January and February, 1823, having been wanting.

See the explanatory notes accompanying the first and second Tables, and at page 110.

Province of Orissa.—The interior of this province is, upon the whole, similar to the Gundwana country, consisting of rugged hills, uninhabited jungles, and deep water courses, ravines, and valleys, covered with forests, and pervaded by marsh-miasmata. The low lands and districts of Orissa, trenching along the bay of Bengal, are under the immediate government of the British. They are frequently subject to hurricanes and to ruinous inundations, from the sudden overflow of the rivers, notwithstanding the embankments. The plains and jungles swarm with insects and reptiles, the exuviae and dead bodies of which tend farther to increase the insalubrity of the country.

Cuttack, the chief district of this province, is low in its direction along the sea coast, and for upwards of twenty miles inland. It is much covered with wood, and is almost altogether inundated by the sea during spring tides. Through this extent of swamp and forest the numerous rivers from the interior discharge their waters through many channels, resembling the Deltas of Bengal and Egypt. About twenty miles from the sea shore the country is considerably elevated, and possesses a dry and fertile soil; and about twenty miles farther inland, it rises into hills, covered with forest trees. The periodical rains do not commence here so early as in Bengal, and are comparatively lighter until September, when the rivers generally overflow their banks, particularly in the low grounds. In November, the weather is generally serene and settled. The thermometer is seldom, at any period of the year, lower than 60°. In February and the early part of March, dense mists are frequent during the mornings. Hot winds prevail in April, May, and June, when the summer heats are very oppressive; but this season is often refreshed by tremendous hurricanes of thunder, lightning, and rain. The climate of this province illustrates, in a perfect manner, the positions laid down in the section on malaria.* (See p. 73.)

* “When the rivers are filled by the periodical rains, many kinds of valuable timber, including teak, are floated down; but the forests are singularly deleterious, and can only be explored during the months of April and May, when the exhalations are least noxious. Both the flat country and the hills swarm with every species of game, including many carnivorous and ferocious animals, besides a plentiful assortment of snakes, vermin, and reptiles, with and without stings, innocent and poisonous.”
—HAMILTON’S *Hindoostan*, vol. ii. p. 39.

The city of Cuttack is built upon a neck of low alluvial land, washed by two branches of the Mahanuddy river, which diverge about three miles to the westward of the city, and in the rainy season insulate it. The country is defended from the inundations of the river by embankments, which are essential to the preservation of the town and cantonments. The mouths of the Mahanuddy, as they pass by the city, rise, during great floods, eight feet above its level. The town is regular and neat, and the roads are kept in good repair. The inhabitants have been reckoned at nearly 100,000. The fortress of Barrabuttee stands about a mile from the city, surrounded by a wide and deep ditch from the Mahanuddy, and frequented by alligators.

Juggernaut, a celebrated place of Hindoo worship, is situated on the sea coast, in the district of Cuttack. The country around is sterile, consisting of low sand-hills. The temple, or pagoda, is surrounded by a populous, filthy, and ill-built town, called Pooree, inhabited by a sickly Hindoo population.

MADRAS PRESIDENCY.

Of the usual Course of the Seasons in the Indian Peninsula.

THE winds in the Indian Peninsula are generally periodical, and have acquired the name of monsoons. The north-east monsoon commences usually about the middle of October, and is attended with dry weather over the peninsula, excepting on its eastern side, which is known as the Coromandel coast. On this coast the north-east monsoon brings the periodical rains, which commence about the 15th of October, and terminate generally about the middle of December. From December to the beginning of March this monsoon continues, but is now a dry wind. The weather is at this season cool and pleasant. The north-east winds cease about the end of February or beginning of March; and from this period to the beginning of June the winds are irregular and the heats intense all over the peninsula. The winds are chiefly from the

south at this time, in the bay of Bengal and on its shores, and are hot, moist, and relaxing. About the end of May the south-west monsoon begins, and is attended with the periodical rains in all parts of the peninsula, excepting Coromandel coast, which then experiences great heat and drought. The south-west monsoon ceases in the end of August or early in September, when the climate is generally sultry, and the winds variable, until the north-east monsoon commences. The quantity of rain which has annually fallen at Madras has been very various for the last twelve years. It has varied from 30 to 80 inches. The more usual quantity is from 50 to 60 inches.

The Coromandel coast differs in its seasons from all the rest of India, as its rainy season commences with the beginning of the cool season, whilst its hot season is dry throughout. Through Hindostan, the rainy season commences before the sun has reached his full northern declination, and continues until he passes the equator.*

* “ The Nagpore and Hydrabad States are subjected to the rains from the S.W. monsoon. The northern division experiences the rains of the N.E. monsoon; but this tract feels also the occasional influence of the S.W. rains. The ceded districts, of which Bellary is the capital, has the S.W. rains, and in some degree also the N.E. The Mysore division, which includes the provinces of Malabar and Canara, gets the S.W. rains; the centre and Presidency divisions have the N.E. rains; the southern division the same; but it is also within the range, in some parts, of the S.W. rains. The Travancore force gets the S.W. rains, as did all the field forces whose returns are included in the tenth Table.

“ The preceding observations, however, can only be received as conveying a very general view of the climate of the Peninsula of India. The N.E. monsoon not unfrequently carries its rains far to the westward of the limits assigned; and, in like manner, the S.W. monsoon refreshes the eastern parts with occasional heavy showers. In some of the more elevated tracts, though the sun be vertical, the air is cold during the rains, especially where the wind blows fresh; but in lower situations, and where the soil is inundated, the air is often extremely hot and oppressive, and is surcharged with moisture.

“ The following cursory remarks on the elevation, by barometrical observation, of the different provinces of the Peninsula, have been drawn from notes, obligingly furnished by Captain Cullen, of the Madras Artillery, whose researches in that and other departments of science are well known and highly appreciated. Without taking into account those habitable, but confined tracts, which are found in the Nihilgherry Hills, at an elevation of 5 to 7,000 feet, and those on the Shervaroy or Salem hills, at an elevation of 4 to 5,000 feet above the level of the sea, the table land of Mysore presents the most elevated surface of the Peninsula. The highest part of this table land includes the stations of Bangalore, Nundidroog, Colar, and Oossoor, forming an area of about 60 miles by 50, and it presents a mean altitude of about 3,000 feet above the level of the sea. There is a rapid fall thence on every

The Carnatic.—The climate of the Carnatic may be generally characterized as dry and hot. The range of the thermometer at Madras is usually from 75° to 92° ; but sometimes, during the hot months of May and June, it ranges as high as 98° , and even 105° . During January, February, March, and April, the monthly mean of Fahrenheit's thermometer rises from 77° to 86° : the extreme variation in each month is usually from 15° to 22° . In May, June,

side; and the mean height of this slope or belt, surrounding the higher area or plateau above mentioned, may be stated at about 2,400 feet. The valley of Seringapatam, including the town of Mysore, is also about the same height.

“ Trichinopoly, the capital of the southern division, is only about 250 feet above the sea; but the ground rises to the southward of this place, attaining at one point the height of 800 feet, so that if a line be drawn through the division by Madura and Palamcottah to Cape Comorin, it would give a mean altitude of between 4 and 500 feet. The country in this quarter has a gradual rise from the eastern shore to the westward, where it is bounded by the great Travancore chain of mountains.

“ There is indeed a very remarkable ascent observable throughout almost the whole of the peninsula south of Berar, from the eastern shore to the great western Ghauts; and one need only cast his eye on the map to perceive this, by the course of the rivers, which uniformly take an easterly direction, and fall into the bay of Bengal. The country, from Madras, by Arcot, towards the bottom of the Pedanaigdroog pass, rises gradually to the height of between 8 and 900 feet above the sea; and a similar slope may be considered to obtain for 60 or 70 miles southward of Madras, and for 130 or 140 miles north of it. The western coast is, however, comparatively bluff and precipitous, rising in abrupt undulations and low hills, which are covered with jungles or forests, from the sea to the great chain of western Ghauts. The mean height of the provinces of Malabar and Canara may be estimated at about 200 feet above the level of the sea.

“ The ceded districts, which adjoin the Mysore territories on the north, partake of the general slope which has been noticed: Bellary, the capital, lying nearly in the centre of the province, is about 1,600 feet above the level of the sea, and the rise continues westward till it attains the elevation of about 2,500 feet. Belgaum in the Dooab is situated at this height, which is nearly the highest part of that province.

“ The average altitude of the province of Hyderabad, including an area of nearly the same magnitude as the Mysore table land, is about 1900 feet above the level of the sea: the city of Hyderabad itself lies low, and is situated near the northern edge of this area. The slope to the east and north west from this elevated portion is rapid; that to the north is much more gradual: the space to the south, between it and the ceded districts, comprehending the bed of the great river Kistna, is from 1100 to 1300 feet above the level of the sea.

“ The elevations of Bangalore and Hyderabad thus interrupt the general slope of the peninsula, which has been already noticed. The country round Jaulna is from 16 to 1800 feet above

July, and August, the monthly mean temperature is usually about 91° , 90° , 88° , and 87° , respectively, the extreme variation being generally from 18° to 23° . During the months of September, October, November, and December, the monthly mean falls progressively from 85° to 77° or 76° , December being generally the coldest month. The extreme variation in these months is from 13° to 18° .

the level of the sea, and the general ascent from east to west is here very distinctly marked. Poonah, situated near the western Ghauts, is believed to be 2500 feet, or nearly so, above the sea.

“ The flat, open plains of Nagpoor seem to indicate their approach to the alluvial districts of the Ganges ; for at the very base of the peninsula, and at a distance of 400 miles from either the eastern or western sea, they attain only an elevation of 800 or 900 feet. Hinginghaut, situated 50 miles south of Nagpoor, is only 700 feet above the level of the sea.

“ The northern division, including Guntoor, is a series of level plains, elevated no where more than 50 feet above the sea. The Ghauts approach the coast near Vizagapatam, without causing any material alteration in the level of the intermediate valleys.

“ The general appearance of the countries above and below the Ghauts is considerably different. The former are distinguished by a dry soil, intersected by streams of running water, having but few tanks, and the general cultivation being that of dry grain ; the latter are more open and flat, sandy, watered chiefly by tanks, and affording the great field for rice cultivation. The jungles below the Ghauts can only be considered as extensive tracts of brushwood ; those above and in the Ghauts are composed of forest trees and bamboo.

“ It has been found that the forest jungles of the western coast are extremely dangerous to approach during the dry season, and that they cannot be entered with tolerable safety until the rains have fallen plentifully : it is said to be comparatively safe to traverse them during the wet season, and during the period when vegetation is going on with vigour. On the other hand, it is reckoned extremely unsafe to enter the forest jungles of the northern Circars during the rainy season or immediately after it ; and the only period at which they can be traversed with comparative safety is the *hottest season*. This leads us to recur to the observation, that the rains on the western coast fall during the hot months of June, July, and August, and those on the eastern coast during the cold months of October, November, and December. Now, though the grass and almost all the small plants are withered and dried up during the hot season on this coast, it is on the commencement of this season, nevertheless, that the trees and larger shrubs put forth their new leaves, and they cast the old leaves during the cool and dry weather, after the rains. If, therefore, the periods of foliation and defoliation of trees *be the same on both coasts*, as appears to be the case, the relative salubrity or insalubrity of the jungles may depend on these processes, and the consequent decomposition of vegetable matter, as much or more than upon the circumstances merely of rain or drought ; the former being the healthy, and the latter the unhealthy periods, in both instances.

“ In a considerable portion of the southern territories, rice culture takes place from the inundation

The soil of the Carnatic, near the sea, is composed of sand and loam, sparingly intermixed with the remains of marine testaceous animals. The inland parts of this province contain hills of syenite, with a small proportion of felspar, the whole soil appearing to consist of the debris of decomposed syenitic mountains. According to local circumstances, it is either a loam mixed with sand and gravel, and strongly impregnated with iron, or, in low and wet places, a stiff, red loam, mixed with vegetable earth and fine sand; on eminences it is generally sand and gravel: it is also in some places impregnated with common salt, which in dry weather presents a saline efflorescence on the surface. Near Madras the soil is a heavy, sterile loam; from this to Vellore the surface is sandy. The country is usually divided into high and low grounds: on the former, various kinds of grain are cultivated; on the latter, rice. In all parts of the country removed from rivers, tanks of large dimensions are very numerous.

The hot and windy season of May, June, and July, is generally the most healthy: sickness prevails most about the commencement of the monsoon, or from August to November. Sometimes, however, the sickness is greatest in December and January, and at other times in June and July. According to the tables calculated from the returns made to the Medical Board, and published in our work on the Diseases of India, the prevailing diseases are fever, dysentery, and hepatitis. The average annual per-centage of sickness in the Presidency division of the Madras army, for the period of six years for which the tables are made out, was 217 per cent in the European, and 70 per cent in the native forces. Of the 217 per-centage of sickness, &c. amongst the Europeans, 30 per cent were fevers, 47 per cent dysentery, and 26 per cent hepatitis. Of the 70 per cent in the natives, 16 per cent were fevers, 2 per cent dysentery, and $\frac{2}{10}$ per cent hepatitis. The proportion of deaths amongst

of the Cauvery river, which is swollen by the western rains; thus placing the surface of the soil under water, while perhaps the appearances of the atmosphere are such as belong exclusively to the dry season. Accordingly, these countries are frequently the seat of epidemic sickness, and they have suffered considerably, and with less interruption, from attacks of cholera.”—(Mr. SCOTT’S *Report on the Epidemic Cholera*.)

Europeans was 9 per cent in the effective strength, and 2 per cent in the natives. The greater prevalence of hepatitis and dysentery amongst the European troops in the Madras than in the Bengal Presidency, seems in some degree to be owing to the greater warmth of the climate, and to the excessive use of deleterious and intoxicating liquors. The per-centage of fever, dysentery, and hepatitis, is in some degree increased at the Presidency, by the number of cases removed there from other stations, either for change of air, for the purpose of being invalided, or in order to embark for Europe.

Arcot and Vellore, situated on the Palaur river, which is dry two-thirds of the year, are in the gorge of the Vellore Valley: the former is 558 feet above the level of the sea, the latter 676. The temperature is here very high. Wallajabad, situated to the eastward of Arcot, and elevated 300 feet above the ocean, is also on the banks of the Palaur. The barracks are low, and much dampness is experienced during the rains. The worst diseases at these three places are hepatitis and dysentery, and seem chiefly to proceed from the use of intoxicating liquors. The country adjoining these cities is open and dry; a circumstance which accounts for the little prevalence of fevers, excepting during the rainy season.

The district of Trichinopoly is an open and well-watered country; hence the climate is not so hot as in some other districts of the Carnatic. The fortified town of Trichinopoly stands on the banks of the Cauvery, and is about 250 feet above the level of the sea. The country around consists of low rice-fields, which are generally under water. The country is open, and upon the whole healthy. Fevers and dysentery are the prevailing diseases.

The district of Tanjore is open and well-cultivated. The rice cultivation is about 50 per cent of the whole. The fortified city of Tanjore is situated in an open plain, and may be accounted healthy. The district of Dindigul and Madura enjoy one of the best climates in the Indian peninsula: May is the hottest month. The town of Dindigul stands in the western extremity of an extensive plain, is about 700 feet above the level of the sea, and is

surrounded by mountains, the highest of which are those towards the west. The country of Madura is less elevated than that of Dindigul. In April and May the thermometer ranges from 79° to 98° , and in January it seldom falls below 66° . The Madura district contains many marshy tracts, within a short distance of the hills, which render the villages in their vicinity unhealthy. Many of the hills are covered with thick woods; and hence there are situations where fevers are always endemic, and with which the natives become affected, particularly in cold and wet seasons. The fortified town of Madura is about 600 feet above the level of the sea, but is low when compared with the surrounding country, which is open, but covered with numerous rice-fields. The town is, upon the whole, not healthy. Fever is the prevalent disease, owing chiefly to the dirty and neglected state of the houses and streets, and the foul and choked state of its ditches and tanks.

Ramnad is situated near the coast, on a low and level plain, and is surrounded by large tanks and salt-water marshes. The cultivation around consists chiefly of rice and cotton. Jungle and low underwood are also abundant. The town is unhealthy even to the native inhabitants, particularly in seasons of scarcity.

The district of Tinnevelly may be called an open and level country. It comprehends several tracts of jungle, especially towards the east. The southern and eastern extremities of the coast contain some very extensive salt-marshes, which are separated from the sea by sand-hills, to the distance of from four to twelve miles, and have no communication with it. After the heavy monsoon of 1810, they were filled to the depth of eight or ten feet, and did great mischief to the adjoining native population. The climate of the northern part of this district resembles that of Madura. The northern monsoon seldom reaches this country until the middle of November, and is seldom so heavy as in the northern districts of the Carnatic. The rains are generally over about the end of December, at which time the thermometer seldom falls below 70. There is always a fall of rain here about the end of January, sufficient to replenish the tanks. The thermometer rises in March to 94.

The towns of Tinnevelly and Pallamcottah are situate near the banks of the Chindintharra river, and are about 200 feet above the level of the sea. Tinnevelly is surrounded by rice-fields on three of its sides; on the other the country is dry and elevated. Courtallum is situated in a small valley of the same name, near the range of mountains which divide this district from the province of Travancore, and enjoys a milder temperature and drier air than any other part of the peninsula.*

Province of Travancore.—This province is situated at the southwestern extremity of the peninsula. Quilon and Anjengo are the chief military stations. The surface of the country is varied by hill and dale, by lofty mountains covered with forests, and by deep and rich valleys. The soil is sandy, and a rich deep loam. The weather is usually hot. Heavy falls of rain take place between June and December. After these showers, the sun generally shines, and produces a disagreeable moist heat. The country is so well watered by numerous rivulets, that few tanks are required. The prevailing diseases amongst Europeans are hepatitis and dysentery; and among the natives, fevers and ulcers of the lower extremities. From the returns during six years to the Medical Board of the Travancore subsidiary force, consisting of about 1200 British soldiers and 2500 natives, hepatic diseases were 22 per cent in the effective strength; dysentery, 17 per cent; and fever, $5\frac{1}{2}$ per cent, amongst Europeans. Fevers were $6\frac{1}{2}$ per cent, and ulcers $10\frac{1}{2}$ per cent, amongst the native troops. In the majority of cases of dysentery and fever met with in this part of India, the liver is more or less affected, as is shewn both by the symptoms during life, and by inspection after death. Diseases of this viscus seem to be more particularly the endemic of the country, as respects the European constitution, dysentery often depending upon the disorder of this organ, and upon the habits of the individual

* The difference in temperature between Courtallum and Pallamcottah is about 10 or 12 degrees, the former being this much cooler than the latter. At Courtallum, even when the rains fall and the sky is overcast, there is little or no dampness experienced under cover. There is here a small waterfall projecting considerably from a rock, under which European visitors bathe, frequently with considerable benefit, when the internal viscera are free from serious disease. The average temperature of the water, at this fall, is from 72° to 75° of Fahrenheit.

affected. Notwithstanding the frequency of hepatitis amongst Europeans in this province, the returns only give $\frac{2}{10}$ ths per cent of this disease amongst the native troops.

Province of Coimbatour.—The centre districts of this province are level and open, and elevated about 8 or 900 feet above the level of the sea. That part which adjoins Dindigul and Madura falls to about 400 or 500 feet. The north and west divisions are mountainous, and at many places from 3000 to 5000 feet above the level of the ocean. Coimbatour is watered by several small rivers, and by the Cauvery, which is filled by both monsoons—by the south-west in June, July, and August, and by the north-east in October, November, and December. In December and January, the thermometer usually ranges from 60 to 80 in the shade, and in May from 78 to 98. About the end of January, heavy dews fall, and the morning fogs continue, in the mountainous parts, till 9 or 10 o'clock, occasioning intermittents and catarrhs among the natives. The soil is generally dry; but in the southern districts, and at the base of the mountains, and in several of the valleys, there is much marshy ground. The central and level part of the province is open and well cultivated; but the southern and western parts abound with wastes and jungle. The mountains and hills are covered with woods, which, with the jungles and wastes, are productive of fevers, during and after the monsoons especially. The country is, upon the whole, healthy, and the houses of the native cultivators more comfortable than in many parts of the peninsula.

Coimbatour, the capital of this province, is surrounded by mountains on the south, the west, and the north, and is open only towards the east. It stands near the Noyel river, and has numerous rice-fields and swamps, extending along the banks of the river, in its immediate vicinity. Fevers are the prevailing diseases in this province, as well as in the districts of Dindigul and Madura; and in some seasons they have become epidemic, particularly amongst the native inhabitants.

Provinces of Malabar and Canara.—These provinces form the principal part of the Malabar coast, and extend from Cochin to Sadashevaghur. They

are comparatively low, but broken and much interspersed with rivers, back-water, and extensive ravines, shaded with woods, and filled with an industrious population. The more inland mountains are covered with forest, jungle, and underwood, and in many places barren. It is on the sides of the valleys and ravines, and on the banks of the rivers, that the inhabitants chiefly reside. There are few towns, and these of no very great size. The chief military stations for European troops are Cannannore, Mangalore, Tellicherry, Calicut, and Cochin. In the month of February, the low country becomes excessively hot, and the vapours and exhalations so thick, that it is difficult to distinguish objects at the distance of three miles. The heat increasing during the months of March and April, a great quantity of moisture is collected, which remains day and night in a floating state, sometimes attracted to the tops of the mountains, where it is condensed by the cold, and descending immediately, is again rarefied, and becomes vapour, in which state it reaches the earth. Thus the vapour and exhalations fluctuate and accumulate, until the setting in of the western monsoon, when the whole is condensed into rain. That portion of the Malabar coast which is washed by the ocean consists of sandy plains, seldom extending more than three miles in breadth. Near the first or low ranges of hills which arise from the coast, these plains are most fertile, and are generally subjected to rice cultivation. Nearer the sea, the surface is more unequal, rising into low downs, on which grow numbers of cocoa-nut trees. This part of the country is much intersected by inlets of the sea, which often run for great lengths parallel to the coast, receiving numerous mountain-streams and rivulets, and communicating with the ocean by several narrow and shallow openings. In other places, where there are none of those salt-lakes and inlets, the low lands within the downs on the sea-coast are, in the rainy season, completely overflowed: for the fresh water has there no vent, and must consequently stagnate, until it is gradually evaporated. As it dries up, it leaves the sands fit for some particular kinds of rice; and it is probably owing to cultivation, and the sandy soil, that the stagnant waters do not materially injure the salubrity of the air: for this country cannot be considered as unhealthy, even with regard to the European constitution.

The rivers and mountain-streams along the whole of the coast are very numerous, owing to the vicinity of the Western Ghauts to the sea. The fresh water poured from them upon the low grounds on the coast, mingling with the salt water in the lakes, inlets, and marshes, which intersect it, would most probably occasion much more disease than actually occurs, if the soil were different from what it is. But here the downs and the sandy nature of the sub-soil are not very productive of exhalations; and the ranges of hills, covered with woods and forests, which in many places rise abruptly from the low grounds and marshes, tend to attract the exhalations and vapours which are generated, and are hence more unhealthy than the low grounds actually are. Thus we perceive that inundations even of sea water are here, as has been observed by Dr. Jackson with regard to the Savannahs of America, not productive of any marked degree of insalubrity, owing evidently to the perfectly sandy nature of the soil and the little admixture with it of vegetable mould or vegetable matter in a state of decay.

The sandy soil extends no farther than the sea coast. In the plains at the immediate feet of the mountains, in the valleys and in the ravines, the soil is a rich red, or loamy earth. The principal towns of these provinces stand on the sea coast, and several of them are built upon the sandy downs, and are nearly insulated by the inlets of the sea, — and the salt water lakes, of which mention has been made. Fevers, dysentery, and hepatitis, are the prevailing diseases amongst Europeans; and fevers and ulcers of the lower extremities amongst the natives.

Province of Mysore. — The whole of this country is enclosed by the eastern and western Ghauts, and consists of a high table land, nearly 3000* feet

* “ The elevation varies at different places; at Piddanaik Durgum pass, barometrical observations gave 1907 feet, at Baitamangalum 2435, and at Bangalore 2807; at Hurryhur 1831; while the same mode of calculation assigns to Sivagunga, the highest mountain in Mysore, an altitude of 4600 feet. The descent proceeding northward is very perceptible. At Sera, on the

above the level of the sea, from which many lofty hills and clusters of hills arise, containing the sources of nearly all the rivers that intersect and fertilize the low countries. Few of these rivers acquire any magnitude until they flow beyond the bounds of the province, excepting the Cavery, which runs through the Mysore valley, and which at the place where it forms the Seringapatam island has already acquired some magnitude.

The island of Seringapatam, on which is built the capital of the province and one of the chief fortifications in India, is formed by the separation and reunion of the river Cavery, and is situated upwards of 2000 feet above the level of the sea. What is termed the small island is formed by another division of this river immediately to the westward. This island lies in a deep valley, bounded, with some variation as to distance, by two large nullahs, and the surrounding country, in every direction, exceeds it greatly in elevation, rising in high hills on every side of it, excepting at the places where the river enters into and passes out of the valley. Seringapatam being under the influence of both the north-east and the south-west monsoons, rainy weather prevails from the beginning of May until the commencement of December. January, February, March, and April, are dry and sultry. From the middle of December till the beginning of February cold and bleak north-east winds prevail; and between this period and the commencement of the south-west monsoon is the hottest season. A damp atmosphere and heavy dews prevail more or less throughout the whole year, but more particularly during the months of January, February, March, and April. The variation of temperature between the day and night is also greater at this

high ground near to the Mahommedan Mausoleum, the height is only about 2223 feet above the level of the sea, which in a distance of 84 miles gives a declension of 584 feet. The climate in this elevated region is temperate and healthy to a degree unknown in any other tract within the tropics. The monsoons, or boisterous periodical rains, which at different times deluge the coasts of Coromandel and Malabar, have their force broken by the ghauts or mountains, and from either side extend to the interior in frequent showers, which, though sometimes heavy, are seldom of long continuance, and preserve both the temperature of the climate and the verdure of the fields throughout the year." — (HAMILTON'S *Hindostan*, vol. ii. p. 349.)

season, as will appear by the subjoined observations made in the open air for one year.

Months.	6 o'clock A. M. Lowest.	3 o'clock P. M. Highest.	Variation.
January	56	95	49
February	55	109	54
March	53	114	61
April	64	114	50
May	67	110	43
June.....	65	101	36
July	64	99	35
August	64	110	46
September	59	110	51
October	61	109	48
November	54	108	54
December.....	52	104	52

The soil on that part of the island on which the fort is situated is dry and rocky. The high ground about Shahar Gangam is a light gravelly and red soil. The south side of the great, and the centre of the little island, together with all that space bounded by the nullahs, consists, with little variation, of a deep, black coloured, and loamy earth. During the monsoon months, water is found by digging ten or twelve inches from the surface near the river; and the whole space bounded by the nullas, together with the south side of the great, and the whole of the small island, being appropriated to wet cultivation, forms a continued swamp for several miles around the island.

The months of March and April, or a little before the setting in of the south-west monsoon, and the month of October at its close, are the most unhealthy periods. During these months the winds are variable; and, from whatever quarter they may blow, must pass over the marshy fields which surround the island. During the south-west monsoon, the south-west side generally suffers the most from the endemic of the country. The fort, although the accommodations in the barracks and hospital are by no means

so spacious or so well ventilated as may be considered desirable, is upon the whole the healthiest part in the island and immediate vicinity. The accommodations for the native troops are unobjectionable. At the time we visited Seringapatam there were several stagnant pools in and about the ditch; there was also a farther nuisance in the necessaries of the native inhabitants in the fort, amounting to about 7000, being on the ramparts, and occasioning, particularly when the ditch was dry, a most offensive exhalation, extending almost to every quarter of the fort. These were recommended to be remedied in an official report, an extract from which is given below.* The character for

* The official report to the government, of which the principal part is subjoined, as illustrating in a satisfactory manner the present subject, resulted from the investigations on the spot of a committee consisting of Messrs. Boswell, Heward, and the author. The report was drawn up by Mr. Boswell, third member of the Madras Medical Board, an experienced and distinguished medical officer; and in the opinions therein offered the other members of the committee fully and unanimously concurred.

“ We now proceed to offer our opinion on the causes of the endemic of Seringapatam, which we conceive to be both fever and dysentery, arising from the same causes, and changing into each other, according to circumstances.

“ From the foregoing account of the low situation of Seringapatam, the moist and stagnant state of the air, and extensive wet cultivation, by which it is in every direction surrounded, it will be obvious that it must be exposed in an eminent degree to marsh exhalation.

“ The abundant supply of water which is furnished by the river, nullas, and numerous annicuts, admits, in many spots adjacent to the island, of three crops in the year. There is, consequently, a constant succession of flooded and marshy fields, which, acted upon by a hot sun in the day, occasions a copious exhalation of noxious vapour, which being condensed by the cold of the night and descending in the form of heavy dews in the morning, causes extraordinary vicissitudes of temperature, as already stated.

“ During the rainy season intermittents chiefly prevail; and though we have spoken favourably of the water in general, yet we have some doubts whether the bowel complaints that are also frequent among the natives at this season, may not, in some degree, be occasioned by the river water being strongly impregnated with vegetable remains, washed down by the numerous streams and mountain torrents, in their course through a jungly and hilly country into this low valley.

“ The season at Seringapatam to which, as being the most fatal, we wish particularly to advert, is that which terminates with the north-east, and commences with the south-west monsoon.

“ In the course of this season are combined all the concurring circumstances which universal experience has confirmed as occasioning unhealthiness. Cold, bleak, northerly winds, with heavy dews in the morning, and sultry oppressive nights, prevail in the early part of this period. From the commencement of the hot weather in the middle of February to the beginning of May the

unhealthiness bestowed upon Seringapatam, as respects both European and native constitutions, has always had the worst effect upon both descriptions of troops stationed here, particularly soon after their arrival; dread of disease proving, as it always does, the most efficient predisposing cause of its supervention.

difference of temperature between the day and night is extreme; and this is the season when bilious remittent fever, the most fatal disease at this station, rages with the greatest violence. Thick fogs, heavy dews, and sultry weather, in the early part of the day, also now prevail; and the sun at this time, having the greatest influence on the rice fields which were flooded by the former rains, and are now becoming dry, acts upon the decayed animal and vegetable matter which they contain; and this action, being promoted by the combined influence of heat and moisture, noxious exhalations must exist at this season more than at any other throughout the year.

“ Marshy ground or rice cultivation, which would be harmless in open situations, with a more rarefied air and freer ventilation, cannot be considered so at Seringapatam, where, owing to the lowness of the valley, and the constant evaporation from the river and surrounding marshes, whatever is exhaled remains, for want of a free current of air, stagnant in the atmosphere, and is precipitated to the surface in a state of condensation during the night.

“ This climate has rain for eight successive months in the year, and the mud and vegetable matter which are then washed down from the hills and neighbouring high ground into the valley must add to the dampness of the soil, and likewise tend to increase the cold and rawness of the winds blowing from a distance.

“ The Loll Baug may be adduced in support of the opinion, that lowness of situation is an essential cause of disease at Seringapatam. It is the lowest part of the island; and it has been universally remarked, that no person has ever resided there, even for a few days, without being seized with fever.

“ The following observations, communicated some years ago by Major Lambton, may tend to throw some light on the nature of the climate of this place, and of the adjoining provinces:—

“ After the conclusion of the western monsoon, the weather on the Malabar coast is delightfully serene, and the atmosphere perfectly clear, till about the middle of January, when the weather becomes hot. The exhalation from the ravines is the consequence; and that increases so fast, that about the middle of February the whole of the low country is covered with a thick vapour, which, from being checked in its ascent by the cold region at the summit of those mountains, continues to collect, until the south-west winds set in, and that immense reservoir is then condensed, and passes over the country in those heavy rains which mark the western monsoon. Previous, however, to the setting in of the rains, the evaporation above the Ghauts is very considerable, and the whole of that valley (in which Seringapatam is situated) which I have described, is covered with a vapour almost as heavy as that which hangs over Canara and Malabar. This is generally in the months of February and March, and in the beginning of April, till the thunder showers clear it away.

“ The general moist state of the climate, and the sudden transition in the temperature, must also

Mysore, the former capital of this province, is about nine miles from Seringapatam, and in the same valley. It is considerably more elevated than Seringapatam, and much more healthy: it is 2500 feet above the level of the sea.

Chitteldroog, a town and fortress in the district of the same name, in the north part of this province, stands on one side of a considerable plain, surrounded by rocky, bare hills, on one of which the fortress is erected. The plain of Chitteldroog consists of a black soil. The water is of a bad quality,

predispose to disease, by checking perspiration, and produce, according to concurring circumstances, either fever or dysentery.

“ We therefore conclude, that in the sudden transition from heat to cold, and in the consequent checked perspiration in the marsh and humid exhalations proceeding from a low unventilated surface, and floating in a dense and stagnant atmosphere, may be found the general causes of sickness at Seringapatam.

“ In addition, however, to these general causes, others more immediately local exist, and which would be considered injurious to the health of the soldier in any other situation. We allude to the defective state of the barracks, and to the fort being crowded with native inhabitants, by whom the European troops in particular are constantly exposed to the temptation of irregularity and intemperance.

“ On reference to the returns of fourteen years, we do not find that, with the exception of those of 1800, 1807, and 1808, the deaths have not been uncommonly numerous at Seringapatam. But no doubt can exist, from these documents, that much more sickness, and particularly fever and dysentery, prevail both among the European and native troops than at any other station.

“ Ever since Seringapatam has been a British possession, committees have been occasionally formed to inquire into its reputed unhealthiness, and various alterations and improvements have at different times been recommended, and at considerable expense carried into effect.

“ We think it our duty to apprise Government, that, after mature consideration of the general causes which have been assigned for the sickness, doubt exists in our minds that Seringapatam ever can be rendered a healthy station.

“ But in the event of this island being considered, in a political point of view, of such importance that every experiment should be tried to effect that object, we shall proceed to propose such measures as, in our opinion, will give it the best and only chance of becoming an eligible station for troops. At the same time we are fully aware of the extensive nature of what we are about to suggest, that the revenues of the country would thereby be materially affected, and that very considerable public expense must be incurred by the adoption of our recommendations.

“ But the duty we have to perform leaves no other consideration on our minds than pointing out,

which has been attributed here, as well as in other parts of India, to the nastiness of the Hindoos, who wash their bodies, clothes, and cattle, in the same tanks and wells whence they take their own beverage. The neighbouring country is unhealthy, although it is dry and open. This is imputed by the natives to the black and rich soil; and from our own observations we consider their inference to be correct. This fortress is about 2300 feet above the level of the sea.

Serah, a town in the western part of this province, is about 2200 feet above the level of the ocean, and is, as well as Chitteldroog, situate in the Seringapatam valley. The climate is dry, but by no means healthy; and has, therefore, been long since relinquished as a military station.

Nundydroog, a strong fort built on the summit of a mountain, about 1700

to the best of our judgment, what will tend to the comfort and safety of the troops. We therefore recommend as follows:—

“ 1. That wet cultivation be stopped throughout the great and small island, including the whole space bounded by the Nullas, and that these grounds be laid out in pasture.

“ 2. That the sale of arrack be prevented throughout the island.

“ 3. That the whole of the native inhabitants be removed from the fort, with the exception of a military bazaar.

“ 4. That new barracks and hospitals be built on the ground in the fort at present occupied by the native inhabitants.

“ 5. That the drains throughout the fort be particularly attended to, and kept clean.

“ 6. To remove the necessaries and all nuisances from the ditch and ramparts. But we do not see how this can be effected and continued to the extent absolutely necessary, in the present ruinous state of the works.

“ 7. That each European soldier at this station be furnished with two flannel shirts and a blanket, and each sepoy with two flannel shirts and a cumley.

“ 8. That the troops in general wear woollen pantaloons throughout the year.

“ 9. That early drills be discontinued, and that the troops on no account be called out before sunrise.

“ 10. That the commanding officers of corps in general be strictly enjoined to caution their men against sleeping in, or exposing themselves to, the night air.

“ 11. That a sufficient garrison of native troops be kept up to prevent the necessity of the convalescents being too soon put on duty.”

feet high, and inaccessible in three-fourths of its circumference, is situate on the table-land of Mysore, and is one of the healthiest stations in this province. The surrounding country is hilly, but fertile, and admitting of high cultivation.

Bangalore, a very large, fortified town, in the east quarter of this province, and the principal military cantonment in this part of India, is also on the table land of Mysore, and is about 3000 feet above the level of the sea. This is one of the most temperate and healthy places in the Indian peninsula. In the year 1800, the thermometer was observed not to rise higher than 82° , nor to fall lower than 58° . The country is dry and open. European fruits and vegetables grow here abundantly, if care be taken in their cultivation.

In this province are many hill forts, several of which are unhealthy, owing to the hills and ravines being covered with woods and jungles: indeed, all the mountainous and hilly districts of this country are more or less subject to endemic fever, generally of the remittent and intermittent types. From the returns to the Medical Board of the diseases of the Mysore division of the army, during six years, including also the stations in Malabar and Canara, the annual average of fever amounted to about 27 per cent *actual* admissions in the effective strength of the European troops, to $22\frac{1}{2}$ per cent of dysentery, and 18 per cent of hepatitis. The prevailing disorders amongst the Sepoys were fevers and ulcers: the former were as high as 47 per cent in the effective strength, the latter nearly 9 per cent.—(*See the Tables in the Sketches of the Diseases of India, &c.*)

The Province of Salem and the Barramahal.—The surface of this province is greatly elevated, forming a part of the table land above the eastern Ghauts. The seasons and climate are very nearly the same as in Mysore. There is much waste land and jungle in this part of the country. Indian corn and rice are the principal grain cultivated. A considerable quantity of cotton is annually produced, both here and in the adjoining territory of Coimbatour. Owing to the great elevation of the country at its northern quarter, the climate is cold during the rainy season, and therefore much deserted by the natives. Salem, the principal town of the district of the same name, is situated in the middle of a valley, and surrounded by mountains. It is upwards of

900 feet above the level of the sea.* Ryacotta, a fortress on a high rock in the Barramahal district, enjoys a very temperate climate, owing to its great elevation. During the hot season, the thermometer seldom rises above 82° of Fahrenheit. This is one of the most healthy stations in this part of the country.

The Balaghaut, or Ceded Districts.—This country is possessed in general of considerable elevation, but not so great as that of Mysore. The southern portion consists of valleys, lying below the eastern Ghauts. The soil of this province is in general rich, especially the black land, large districts and plains of which are to be met with, particularly in the western districts. This rich, black soil consists of a pure mould, from two to twelve feet deep. It contains no remains of trees. Round the hills and rocks, which are numerous in this country, the soil is generally a red gravel, and in many places both the red and black soils are mixed with sand and calcareous fragments. The soil is most fertile, particularly the black mouldy land now mentioned. The rains are uncertain until September and October. They usually fall in June, but if they fail in that month, the whole crop is in danger of being lost. Cotton is abundantly cultivated throughout the province; indigo is also raised.

The vicissitudes of temperature and states of the atmosphere in this province are very great and sudden, as in Mysore. The thermometer ranges in January from 60° to 93°, and there are heavy fogs and variable winds. In February the thermometer is from 60° to 98°, and the weather is oppressive and sultry: south-east and south-west winds prevail. In March, the temperature ranges from 68° to 105°: strong south-west winds blow. Close and oppressive weather, and sudden vicissitudes of temperature and sultry nights, are experienced during this month. The thermometer ranges in April from 76° to 107°, and the weather is cloudy and oppressive, with strong winds from

* The Shervaroy mountain, which rises to about 5000 feet above the level of the sea, is in the vicinity of Salem. It and the adjoining high grounds have been thought of as a place suitable for the resort of invalids; but intermittents and remittents have prevailed here, particularly after the rains, amongst those who have resorted to this place for change of air. The Nilgherry hills and the adjoining country have been recommended for this purpose with more propriety. For some account of them, see the Appendix.

the south-west, some showers, and clouds of dust. This kind of weather continues until September, when the rains commence. In November and December the thermometer ranges from 60° to 87°. The dews at night are then heavy, and are followed by fogs in the morning. From March to December is the most sickly period of the year. The weather and climate, upon the whole, are nearly the same as in Mysore.

Bellary, a hill fort, the head-quarters and cantonments of this division of the army, is 1600 feet above the level of the sea. Adonie, the principal town of a district of the same name, enjoys an elevation of 1400 feet. Gooty, a strong fortress and military station, stands on a syenitic hill, elevated about 2200 feet above the level of the ocean. But notwithstanding this height, the temperature here during the hot season is intense, particularly during the months of April and May. The flat country adjoining these towns is about 1200 feet above the level of the sea; and from this plain hills and mountains arise, like islands out of an immense lake. Kurnoul, a fortified town in the district of the same name, and formerly a military station, stands on the extremity of a neck of land formed by the junction of the river Hinday with the Toombudra. The country adjoining consists of black cotton ground, and is covered in many places with jungle and palmira trees. The elevation of the town is about 900 feet above the level of the ocean. The prevailing diseases at this place are fever, dysentery, and hepatitis. Fever may be considered as being, in some degree, promoted by the situation of the town and the nature of the soil. Dysentery and hepatitis, although most probably resulting in some measure from the same causes, yet seem to us to depend more upon the intoxicating liquors which the European soldier may so readily procure at this place.

The district of Cuddapah is generally a level country, surrounded on all sides, excepting the north-west, by hills. Although it is elevated about 500 feet above the level of the sea, the heat during the months of April and May is very great. The rains commence earlier here than in Mysore. The great monsoon rains occur as on the Coromandel coast, and during their prevalence the miry and soft state of the soil renders the country nearly impassable. Thunder-storms are frequent and heavy during April and May, and tend to cool and purify the air. The well-water in the low grounds, where the black

cotton soil abounds, is considered unwholesome. Soda is abundant in this species of earth, and may contribute to render the water productive of bowel complaints. The town of Cuddapah is surrounded by low, marshy, and jungly fields. The town of Sidhout, situated in a valley in the district of that name, is considered healthy by the natives.

The Northern Circars.—This province, situated along the west side of the Bay of Bengal, from Gangam to Coringa, appears mountainous as viewed from the sea; and from Coringa, southwards, low, flat, and sandy. The whole sea-coast is of a sandy soil. Numerous small rivers flow through the north part of the province, and the southern districts are watered by the Godavery and Krishna rivers and their numerous mouths and contributory streams. To the south of Coringa, strong north-east winds prevail along shore for the first two months of the year, which, together with the sea breezes, moderate the heat. But where the winds pass over salt stagnant marshes, as they do on almost every part of the sea-coast of this quarter of the province, their influence upon health is most baneful. During March, April, and part of May, high winds from the south-west prevail, and are attended with clouds of dust. In the months of May, June, July, August, and September, the wind generally blows from the west over an extensive parched soil, and hence becomes intolerably hot, so that the thermometer not unusually reaches 110°, or even 112°, and even stands above 100° at midnight. In the hilly and more inland parts of the province, the air, owing to the exhalations from the jungles and forests, is unwholesome, particularly in the valleys and ravines by which the hilly districts are intersected.

Ganjam, the chief town of the district of the same name, the most northerly of the province, stands near the mouth of a small river. The country to the north of the town is low, and generally inundated during the rains; to the south and west the country is hilly, and intersected with valleys. The showers which fall in the months of May and June throughout this extensive district, and the heavy and incessant rains in August, September, and October, wash down from the hills much vegetable and animal matter, which, being deposited on the low grounds, and resting in marshes and sometimes accumulating in tanks, is acted upon by the sun, becoming the source of endemic and epidemic diseases, whenever circumstances favourable to their

supervention occur. This and the districts of Vizagapatam and Rajamundry contain extensive woods and thick jungles. The last-named district comprehends the Delta of the Godavery, which is low, highly cultivated in many places, and in others marshy and overrun with jungle. The rains set in here, as in Ganjam, with gentle showers during June and July, and terminate at the commencement of November. The whole of this part of the country is unhealthy, and fevers occasionally are epidemic. The more southerly districts of this province are more level, have a sandy soil in some places, and in others a rich dark mould.

With the exception of Masulipatam and Ellore, the military stations in this province are situate in the vicinity of mountains and thick jungle, interspersed with swamps. The climate, from November to March, is pleasant. The thermometer generally ranges from 72° in the morning to 90° in the day. The prevalent diseases are fever and dysentery, which occur most frequently from August to November. June and July are, upon the whole, healthy; but owing to the high temperature and great power of the sun in the dry and sandy districts of the south of this province, *coup de soleil* is a frequent result of incautious exposure during these months. The fevers of the country are generally bilious remittents of the most severe form, and they occasionally assume a typhoid and malignant character, particularly in the hilly, swampy, and jungly districts. At Masulipatam and Ellore, situate in an open country and sandy soil, the fever is much milder, although of a similar character. It will be perceived, upon reference to the Table published in our Sketches of the Diseases of India, that the *actual* admissions of fevers were annually, amongst the European troops, $13\frac{1}{2}$ per cent in the effective strength; that dysentery was nearly 13 per cent; and hepatitis was $5\frac{1}{2}$ per cent. Amongst the Sepoys, fevers were 29 per cent in the effective strength.

Province of Hyderabad.—The surface of this province is hilly, but not mountainous: it is an elevated table-land; hence its temperature is lower than the latitude indicates. At the city of Hyderabad, and in the country northward, the thermometer, during the cool season, is often as low as 40° , and 45° of Fahrenheit. To the south of this city the country is thinly inhabited, and covered with much jungle, although the country is fertile. The south-

west monsoon usually commences about the beginning of June, and continues, with some intervals, till the middle of October. During November and December the sky is generally cloudy, the winds easterly; and sometimes, when the north-east monsoon is heavy, a considerable quantity of rain falls. Dews are frequent during January and early in February; but both these months, and March, April, and May, are dry. The annual fall of rain is estimated at 32 inches. The mean monthly temperature, in-doors, may be considered nearly as follows:—January, 73° ; February, 75° ; March, 82° ; April, 89° ; May, 90° ; June, $86\frac{1}{2}^{\circ}$; July, 81° ; August, 79° ; September, 78° ; October, 78° ; November, 75° ; December, 73° ; giving an annual mean of nearly 80° . This is perhaps a little higher than the thermometer, placed in a more exposed situation, may have indicated. The daily range of the thermometer is often very considerable, particularly during November, December, January, and February, amounting, in the shade, generally to about 20° , and not unfrequently to 30° .

Secunderabad, where the subsidiary force is stationed, stands about three miles from the city of Hyderabad, and is about 1850 feet above the level of the sea. The country around has a barren and rugged appearance, and the ranges of hills have an irregular and jumbled aspect.* The most sickly period is generally during the rainy and cold seasons, and the proportion of European deaths is greater at these periods. Fevers and dysentery are the

* The European barracks are built on a low and rocky situation, and stand on the eastern extremity of the cantonments, which face the north, and are surrounded on three sides, on the west, the east, and the north, by high ground, in order to protect them from the northerly high winds. They are often enveloped, from the close of the day till after sunrise, by so thick and dense a fog as completely to obscure them even from the hospital, which is built upon the rising ground in the vicinity, and is not more than 250 paces distant. The native barracks are situate on the elevated ground on the north face of the cantonments, and differ from those of the European troops, inasmuch as they merely consist of the Sepoy hospitals and places of arms; the Sepoys hutting themselves with their families at some distance in rear of the barracks, and being there only on duty. The situation, therefore, of barracks, in regular cantonments, has much less to do with the general health of the native troops than with that of Europeans; the former seldom being in barracks, the latter always living in them. The above circumstances respecting the situation of the cantonments, and the dense fogs so frequent in this part of the country, together with the facilities of procuring intoxicating liquors at no great distance from the barracks, may partly account for the prevalence of disease in the European corps.

most prevalent maladies; in almost every case of which occurring amongst Europeans, the liver is more or less diseased. According to the Table given in the Sketches of the Diseases of India, the *actual* admissions of fever were annually about 34 per cent in the effective strength of Europeans; of dysentery, nearly 37 per cent; and hepatitis, $10\frac{1}{2}$ per cent. Amongst the Sepoys, the actual admissions were $30\frac{1}{2}$ per cent of fevers annually in the effective strength; dysentery, 6 per cent; ulcers, 6 per cent; and rheumatism, 9 per cent. The annual proportion of sickness, of every kind, was 150 per cent in the European troops, and 85 per cent in the native corps. The annual per-centage of deaths amongst Europeans was 8 in the effective strength, and 3 among the Sepoys.

The Province of Bejapoor.—A great part of this province is now included in the recently *ceded districts*, and the general aspect of the country, the climate, and the seasons, are the same with the other districts already described under that name. (See page 153). The western parts of this province are very mountainous and woody, particularly in the vicinity of the Ghauts. Towards the east the country is more level, and is watered by several fine rivers, the largest of which are the Krishna, Beema, and Toombudra. Wastes and jungle are abundant throughout the province.

Province of Aurungabad.—The surface of this province is very irregular, and in general mountainous, particularly towards the western Ghauts, where the hills rise to a great elevation. Rice is the grain which is principally cultivated. The city of Aurungabad contains about 60,000 inhabitants. On the north it is bounded by marshy ground, beyond which is a semicircular range of hills of considerable elevation. The central parts of this city are nearly on a level with the marshy ground. Tanks of water abound throughout the town, as well as in its vicinity, from which foetid exhalations arise towards the end of the dry season. The soil on which the city stands is alluvial, and of very considerable depth. The military cantonment is situated upon a rocky plain, about a mile S.W. of the city. The hospital is in an airy situation, is well-built, and has sufficient accommodation for 200 sick. Mr. Young states, that the cantonment must be “considered healthy, as the average number of sick, in each native corps of nearly 1000 men, has not for some years been

above 30. This, when contrasted with the state of disease in the city, is most striking, and points out the vital importance which ought to be attached to the selection of proper locations for cities, as well as for military cantonments."

Jalnah, an important military station, about forty miles to the east of Aurungabad, is, with the surrounding country, elevated about 1700 feet above the level of the sea. The country adjoining Aurungabad and Jalnah forms the chief part of the eastern districts of the province. For two-thirds of the year, the wind in this part of the province is west-south-west. Easterly winds prevail only during November, December, and January. The range of the thermometer during these three months is usually from 50° to 86°, the variations of temperature being both great and sudden. During the hot months the thermometer ranges from 78° to 100°. The average annual fall of rain is generally about 35 inches, but is often much below this quantity. The prevailing diseases in this part of the province are intermittents, remittents, and dysentery. Indeed, both the aspect of the country, the climate and seasons, as well as the diseases, are nearly the same in the eastern districts of this province, as those already noticed with respect to the province of Hyderabad.

The Province of Khandesh is hilly and irregular, although not mountainous. The numerous valleys which intersect its hills are close and hot. Their sides are covered with wood and thick jungle. The Tuptee and Guirna, with their tributary streams, are the principal rivers flowing through the province. The banks of the former are deep and precipitous, consisting chiefly of a firm black earth. Adjoining the river are numerous deep ravines, through which the roads frequently pass. The climate and seasons are here nearly the same as described when speaking of Aurungabad and Malwah.

Having given as full and succinct an account of the topography, climate, seasons, and most prevalent diseases, of the different provinces under the Madras Presidency as our limits could permit, we shall conclude this part of our subject with an abstract of the per-centage for one year of the actual admissions of the different prevailing diseases in each province, taken from the official returns made to the Madras Medical Board. We have preferred the returns for 1821, as they are the most recent, and best suited to shew the results.

GENERAL ABSTRACT OF THE PREVAILING DISEASES

IN

THE DIVISIONS OF THE MADRAS EUROPEAN ARMY,

FOR THE YEAR 1821.

Divisions.	Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhoea.			Per-Centage of Admissions in the Effective Strength.					Per-Centage of Deaths upon Admissions.					
	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	
Presidency	76	64	7	747	648	49	637	581	11	498	454	29	145	108	9	5	52	44	34	10	1	6	13½	6	6	4½
Centre Division	25	18	6	128	102	11	44	39	4	142	97	5	8	8	0	6	31	11	35	2	24	9	9	4	4	0
Southern Division	34	27	8	245	197	39	285	268	9	157	143	3	99	95	1	31	24	28	15½	10	23	16	3	2	2	1
Travancore	23	22	0	115	105	9	34	34	0	214	206	1	15	13	1	2½	12	3½	21½	1½	0	8	0	½	½	7
Northern Division	15	10	5	17	15	1	36	34	3	26	23	2	28	4	1	3½	4	8	6	6½	33	6	8	2	4½	3
Mysore	111	106	3	616	538	43	478	439	9	605	502	28	22	21	1	5½	30	24	30	1	0	7	2	4½	3	1
Ceded Districts	4	4	0	75	70	3	373	366	1	65	54	3	1	1	0	1	15½	79	14	0	0	4	½	5	0	0
Hyderabad	14	13	1	401	336	26	480	448	6	99	91	0	22	20	0	1	34	40½	8½	2	7	6½	1½	0	0	0
Nagpoor	43	34	9	289	244	31	792	741	16	65	56	4	82	71	6	4½	29	81	6½	8½	21	11	2	6	6	7
Doab (between the Tamboodra and Krishna rivers	12	12	0	227	235	24	283	269	7	93	83	5	3	3	0	2	48	48	16	0	0	8½	2½	5	5	0
Total	357	310	39	2910	2510	236	3442	3219	66	1964	1709	80	425	364	19	4	30	36	20½	4½	11	8	2	4	4½	4½

BOMBAY PRESIDENCY.

THE island of *Bombay*, on the coast of the province of Aurungabad, formerly consisted of a group of small islands, with numerous back-waters, producing rank vegetation, at one time dry, and at another overflowed by the sea. The new town of Bombay is built in a low, muddy, unwholesome tract of land, “which, during the monsoon, has the appearance of a shallow lake, many of the houses being then separated from each other by water; so that the inhabitants suffer from the inundation and its effects during seven or eight months of the year. At all seasons, the ground floor of many of its houses are on a level with high-water mark, some below, and but few actually above it at full spring-tides.” The fort stands on the south-eastern extremity of the island, on a narrow neck of land, formed by Back Bay on the western side, and by the harbour on the eastern. The town, within the walls of the fort, consists of houses built after the original Portuguese plan, standing on wooden pillars, supporting wooden verandas. The northern portion of the fort is inhabited by Parsee families, who are not remarkably cleanly in their domestic concerns, nor in the streets where they live. The sea is on three sides of the fort, and on the fourth is the esplanade, at the back of which is the Black Town, amidst cocoa-nut trees. Much of the rain-water which falls on the esplanade and Old Town passes through the New Town to the sluices at Worlee. Although the sea be now excluded, the rain-water still collects in the lower parts of the island, where the surface is said to be twelve feet under high-water mark at spring-tides, and during the monsoon forms an unwholesome swamp. Owing to the height to which the spring-tides rise, being usually fourteen or fifteen feet, extensive docks have been constructed at Bombay, and ship-building has been prosecuted on a large scale. This has contributed to the importance of the place, to the crowded state of the town, and to its extensive population, which may be considered but little short of 200,000, of every denomination. The island of Salsette adjoins Bombay. It is covered with thick jungle, and although so near the Presidency, but little of it is cultivated.

Owing to those circumstances, and the confined state of its dells and ravines, it is still more unhealthy than Bombay.

Poonah, a military station under the Bombay Presidency, and a populous city, is situated about thirty miles to the eastward of the western Ghauts, and is elevated about 2500 feet above the level of the sea. This city and the vicinity is comparatively healthy. The alternations of temperature are here great and sudden. The prevailing diseases are intermittent and remittent fevers.

The Province of Gujerat, particularly towards the eastern frontier, is very hilly, and much covered with jungle. The western boundary, extending along the Banass river, is a level and arid country in some parts, and in others a low salt swamp. The interior of the Gujerat peninsula is hilly and rocky, interspersed with numerous jungles and swamps. The country generally is much intersected by deep ravines and ground broken up by the rains. During the hot and dry months, the surface of the country appears to consist of a fine sand and dust, which in the rainy season becomes a thick mire.

Westerly winds prevail the greater part of the year throughout the Gujerat peninsula. In May and June the winds are very hot. During December and January east and north-east winds are prevalent, and remarkably thick fogs generally are observed every morning throughout these months.

Kairah, the chief town of a district of the same name in this province, and the principal civil and military station, is situated near the Sankermuttee river, on an alluvial soil, about thirty-five miles to the north of the bay of Cambay. It is exposed, during the westerly winds, which prevail the greater part of the year, to the exhalations transported by them from the numerous salt-water marshes and jungles to the westward, more especially from those near the heads of the bays of Cambay and Cutch.

We have not been able to procure any medical documents or returns respecting the Bombay Presidency, and therefore we cannot draw any com-

parison between the salubrity of the districts under its government, and those belonging to the other Presidencies. But the insalubrity of Kairah, as a station for European troops, compared with Poonah, is striking. Poonah has always been considered a healthy station, both for Europeans and natives.

For the subjoined Return, as well as for an account of the loss in His Majesty's 17th regiment of Light Dragoons, during a residence in India for fourteen years, from 1809 to 1822, we are indebted to Sir John Malcolm. From this Return it appears, that the 17th Dragoons lost, in fourteen years, 27 officers and 772 men, including trumpeters, non-commissioned officers, and rank and file; which is 42 men more than the annual average effective strength of the regiment for that period; viz. 730 men.

This regiment, we believe, served in the province of Gujerat during the greatest part of its residence in India; and, when not employed on actual service, was generally stationed at Kairah, in that province.

This fact, connected with the great mortality of the 4th Dragoons, which relieved the 17th at Kairah, shews that this part of India is extremely unwholesome to Europeans. It is a singular fact, that, during the period of 1816, 17, and 18, while the 17th Dragoons were employed on actual and active field service, they lost fewer men than at any other time of their service in India, as the following Table will shew:—

No. I.

Deaths in His Majesty's 17th Dragoons, from 1809 to 1822 inclusive.

Years . .	1809	1810	1811	1812	1813	1814	1815	1816	1817	1818	1819	1820	1821	1822	Total.
Officers . .	—	—	2	2	5	6	1	3	1	1	2	2	—	2	27
Men . . .	60	45	44	38	166	96	57	32	22	37	60	70	37	8	772

No. II.

Comparative View of the Salubrity of Kairah, in Gujerat and Poonah, Aurungabad.

Years.	Strength of the 4th Dragoons. Kairah.	Loss by Death.			Strength of the 47th Regt. Poonah.	Loss by Death.		
		Officers.	Men.	Total.		Officers.	Men.	Total.
1822	569	2	52	54	575	—	20	20
1823	513	—	59	59	950	1	18	19
1824 July 25	596	5	42	47	960	—	6	6
Total	1678	7	153	160	2485	1	44	45

ISLAND OF CEYLON.

CEYLON is usually divided into an upper and lower country. The former occupies the greater portion of the southern part of the island; the latter, the northern, encircling also the high and inland terrace of the southern part. The upper country is elevated from 1400 to 2500 feet above the level of the sea; and in some places mountains rise to the height of 6500 feet. Winding valleys intersect the hills and irregular eminences. These are, for the most part, narrow and marshy. There are no lakes in this part of the country; and the mountains and hills are covered, from their bases to their summits, with trees, jungle, and low underwood: hence the whole has a woody and impenetrable appearance. Owing to the exuberance of vegetation, and its constant succession, there is always an abundance of decayed vegetation, which, with the exuviae of insects and reptiles, tend to vitiate the atmosphere, more particularly in the ill-ventilated dells and ravines by which this part of the country is broken.

The lower and comparatively flat portion of the island forms more than three-fourths of its whole extent. This part is also extensively covered with

jungle and forest trees, and intersected, more particularly in the southern division of the island, by numerous small rivers, the majority of which have their origin in the upper country. During heavy rain, and particularly about the time when the monsoons change, the rivers inundate large tracts of the low grounds, all intercourse between one place and another being then carried on by means of small boats.*

* The following remarks, from Mr. MARSHALL'S *Medical Topography of Ceylon*, give a satisfactory idea of the climate of the island. We are happy to have occasion to recommend Mr. Marshall's unpretending but truly excellent work to the notice of the Indian practitioner: we are only sorry that it did not come in our way until very recently.

“The air of the interior is influenced both by the south-west and north-east monsoons. The south-west monsoon commences about the latter end of April or beginning of May, and is in general ushered in by strong gusts of wind, thunder, lightning, and torrents of rain. The wind gradually veers from the south-west to west, from which direction it blows until some time after the summer solstice. The north-east monsoon commences about the end of October or beginning of November; and is likewise generally accompanied with heavy rains, thunder, and lightning. The hills of the interior intercept the clouds as they pass over the island during the existence of both monsoons. Hence the frequent rains and genial showers which fertilise the soil and refresh the exuberant foliage of the plants on the hills. The showers are often very partial in extent, and frequently of short duration. Heavy showers are often immediately succeeded by bright sunshine and fine weather, and these alternations are sometimes frequently repeated in the space of an hour. The hilly surface of the elevated terrace tends very considerably to divert the lower strata of the monsoon winds from their direct course, by which means the winds appear to be more variable than on the coasts of the island. The steady influence of the monsoon is, however, very evident, by the regular direction of the higher clouds.

“The period between the decline of one monsoon and the steady operation of the other, or during the months of May and October, is frequently marked by heavy morning fogs, occasional strong gusts of wind, and often by heavy rains. In calm weather the fog continues until the morning be far advanced. Long after the fog has disappeared from the tops of the lower hills, it continues to cover the little chasms and valleys that divide them; and, from an elevated point, these vapours appear remarkably dense, margined, and of an almost snowy whiteness.

“When the weather has been for a considerable time dry, the air is frequently arid and uncomfortable. The surface of the earth becomes hardened and divided by deep fissures, particularly where the soil is clayey and tenacious. The great dryness of the air on the hills, when compared with the humid condition of the atmosphere on the coast, in certain states of weather, is remarkable.

“In particular seasons the rains are very heavy, and often continue without much interruption

The insular situation of Ceylon tends much to equalise its temperature. Owing to this circumstance, and to its exposure to the influence of both monsoons, the average temperature of the year is high, but the extreme range of the thermometer is not great, and the medium range is inconsiderable. Dr. Davy considers the mean annual temperature on the coast to be about 80° , the extreme range of the thermometer to be between 68° and 90° , and the medium range between 75° and 85° . Different parts of the island,

for several days together. During these heavy rains streams are formed, which rush down the sides of the hills, and convert insignificant rivulets into large rivers, that roll along with a tumultuous current, disdaining every impediment. The rivers receive a constant increase from subsidiary rivulets and mountain torrents, which flow into them, and eventually rush down the craggy sides of the precipitous parapet that faces the sea.

“ The air, on the flat country which stretches along the eastern and northern coast of the island, is very dry and hot during the south-west monsoon. Showers rarely occur there between the months of May and October. During the influence of this monsoon, a hot land wind blows from the interior towards the eastern and northern coast of the island. This wind sets in about the middle of May, and blows, with but little intermission, till the end of August. In the other months of the year there are regular sea and land breezes. While the land wind prevails, there are but rarely any sea breezes. The land wind often blows day and night for several weeks together, without much abatement; it is always very dry and hot: the mercury in a thermometer (Fahrenheit) placed in the shade rises as high as 95° , and sometimes higher. The land wind extends along the coast from Batticaloe to Jafna; perhaps, however, its influence is more felt at Trincomale and in the neighbourhood of this station than at any other place. This wind becomes perceptible almost immediately below the hills that bound the upland terrace towards the north-east. As the wind approaches the coast, it acquires both strength and temperature. In some countries the existence of hot winds has been ascribed to extensive tracts of sand heated by the sun. This cannot be the origin of hot winds in Ceylon; for here they commence shortly after the fall of the rains which accompany the setting-in of the south-west monsoon, and blow towards the coast, over hills covered to their summits with trees, and over swampy valleys, thickly overgrown with low underwood, which extend to the very edge of the sea.

“ The temperature of the air is, however, considerably influenced by situation. In close and confined spots the heat is sometimes very great; in such places I have seen the mercury rise as high as 100° in the shade. The ordinary temperature of a spring called the King's Well, in Kandy, is about $73\frac{1}{2}^{\circ}$. This is nearly the average temperature of the atmosphere. There is a small spring on the top of Adam's Peak, in which I found the temperature to be 53° in the month of April 1819. At five A. M. the thermometer indicated an atmospheric temperature of 51° in the same situation.”

however, exhibit some peculiarities with respect to temperature. That part of the coast immediately exposed to the south-west monsoon is remarkable for equality of temperature and humidity of the air; whilst the side of the island to which this wind passes over-land is remarkable for a higher temperature and a drier atmosphere; and the mountainous districts, according to their elevation, are equally remarkable for variety of temperature and dryness. Columbo is a good illustration of the first kind of climate. Here the thermometer seldom ranges higher than 85° , or lower than 75° ; the mean annual temperature being about 79° . Owing to the immense tract of inter-tropical ocean over which the south-west monsoon travels, this wind is saturated with moisture when it reaches the west coast of the island: hence the equality of temperature, and the rapid decay of whatever may be injured by humidity.

During the prevalence of the north-east monsoon, the climate of Columbo, and the whole of the west and south-west side of the island, is different; the temperature being lower, and the atmosphere drier.

On the eastern side of the island the north-east monsoon blows during the coldest months of the year; the mean temperature of these months being about 77° . The south-west monsoon is here a land wind; and having had its temperature increased by the dry and hot districts of the island over which it has passed, and blowing during the hottest months, the mean monthly temperature is generally about 82° during its continuance. The annual mean temperature of this side of the island is about $80^{\circ} 4'$, according to the observations made at Trincomalee.

In the interior mountainous districts the climate of the island is different from that of the low country on the coast, and this difference increases with the elevation. The vicissitudes of temperature become also greater the higher the elevation above the level of the ocean. The mean annual temperature of heights, between 1500 and 6000 feet, is considered by Dr. Davy to vary in Ceylon from 73° to 50° . This is corroborated by the

observations made at Kandy, situated about 1467 feet above the level of the sea, in lat. $7^{\circ} 17' N.$, and surrounded by wooded hills.*

Mean Monthly and Annual Temperature, and Fall of Rain, at Kandy; being the Average of Observations made in 1817—20.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual Mean.
Mean Monthly Temperature...	$71\frac{1}{6}$	73	$73\frac{2}{5}$	$74\frac{1}{4}$	75	$73\frac{5}{8}$	$73\frac{1}{2}$	$73\frac{1}{4}$	$73\frac{1}{6}$	$73\frac{6}{10}$	$72\frac{7}{8}$	$72\frac{6}{10}$	$73\frac{1}{4}$
Mean Monthly Fall of Rain...	1.0	0.4	8.1	11.7	6.6	2.3	10.7	3.5	8.2	7.1	7.1	18.6	84.3

* * * The extreme variation in twenty-four hours was from 12° to 23° .

Mean Monthly and Annual Temperature at Trincomalee, with the extreme Variation in each Month.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual Mean.
Mean Monthly Temperature...	77	$78\frac{6}{8}$	$80\frac{1}{4}$	$82\frac{5}{8}$	$83\frac{1}{6}$	$83\frac{1}{2}$	$82\frac{1}{3}$	$81\frac{1}{2}$	$82\frac{1}{2}$	$79\frac{1}{2}$	$78\frac{3}{4}$	$77\frac{1}{2}$	$80\frac{1}{2}$
Extreme Variation	7	5	6	8	10	11	10	10	11	10	8	7	—

With respect to the chief causes of endemic diseases in Ceylon, Dr. Davy offers the following remarks, which, as they illustrate very satisfactorily what we have already advanced, with a reference to warm climates generally, we shall give in his own words. “A variety of circumstances conduces to the salubrity of the mountainous districts: the principal circumstances in Ceylon seem to be the frequent occurrence of showers, tending to wash the decaying remains of vegetables to lower levels; the cooler air that, at the same time,

* Dr. Davy's Travels in Ceylon, pp. 64—67.

invigorates the animal frame and retards vegetable putrefaction; and the frequent thunder-storms, which, while they agitate, seem to purify the atmosphere. The *precise cause* of the extreme unhealthiness of the low, wooded parts of the country that have not the benefit of a sea breeze and of cultivation, is still obscure. Whatever it may be in Ceylon, it appears to be contained in the air or wind from low, uncultivated country covered with wood. It appears, too, to be connected with great dryness of the air,* being most active during the longest droughts, and generally disappearing with the commencement of the rainy season; and this so regularly and generally, that, knowing the season that is sickly in any part of the low country, you need not inquire if it be dry, or *vice versâ*. The probability is, that the cause in question is some effluvia produced by the decomposition of vegetable matter, but of what nature, yet remains to be investigated." With respect to Ceylon it may be remarked—and it is equally applicable to the rest of India and to all warm countries—that steady breezes blowing from the sea, without having passed over marshes or jungles, are generally a cause of salubrity; and that unhealthiness is greatly owing to the nature of the country or district over which the periodical or occasional winds pass. "Thus," as Dr. Davy states, "Trincomalee (and very many other places throughout India, as well as Ceylon, may be adduced) is never very sickly whilst the north-east monsoon prevails: is never so, till the south-west wind reaches it from the opposite shore of the island, after having passed over a great extent of low, wooded, and very unwholesome country. But there are instances of occasional insalubrity of air that cannot be thus explained; and instances too, unfortunately of common occurrence, especially in the Kandyan country. Particular spots and districts that have been remarkably healthy for years, have suddenly changed their character, and passed from the extreme of

* "Though this state of air may retard the decay of vegetable matter on the surface of the ground, it may have a contrary effect on that beneath the surface; and that it will occasion an increased exhalation there can be no doubt. The quantity of exhalation that takes place from the low flat grounds during the dry season must be immense. The foliage in general continuing green during the longest droughts, is a satisfactory proof that there must be a stock of moisture below, equal to the great demand on it."

salubrity to that of insalubrity. They have remained some time in this state, and have gradually returned to their former condition."

Chittagong, Arrakan, and Rangoon.—The sea coast of the *Chittagong* district is low, marshy, and jungly, with interspersed patches of cultivated ground. The soil is chiefly alluvial, much intersected by rivers, and in many places divided into low islands, which are only partially subjected to a rice cultivation, and much overrun with low and thick jungle. From the sea coast considerable ranges of hills arise, and extend in a northerly and southerly direction. These are also covered with low and dense woods and jungle. Beyond these mountains tracts of jungle and marsh grounds extend, forming the boundaries between the territories of the Honourable Company and the Birman Empire. This country, more particularly the mountainous and swampy districts adjoining Arrakan, are but thinly inhabited; the only clear and cultivated spots being paddy fields. The rainy season generally commences here, and along all this side of the bay of Bengal, earlier than in any part of the Bengal province, and it is seldom over until the middle of November. The temperature of the climate is very variable, the days being often excessively hot, and the nights cold and damp. During the prevalence of easterly winds the nights are often excessively raw, and in the early part of the morning thick fogs generally accompany the easterly winds.*

* The account we have now given of Chittagong entirely applies to Arracan. But in order more fully to illustrate the chief causes of those forms of disease which proved so destructive at this place, and of which we shall soon have occasion to treat, we shall give, in the words of the author, a well-written account of the medical topography of Arracan, furnished by Mr. Grierson to the Medical Board, and placed at our disposal, with other valuable documents, through the liberality of the honourable the Court of Directors.

"The town of Arracan is in 20° 38' north latitude, and about 93° 15' east longitude. Its site is such as one would at first sight pronounce to be prolific of those noxious exhalations, whatever they may be, that are generally allowed to engender intermittent fever. It lies on the banks of a muddy river, or rather the ramifications of a river, buried among hills, at a distance of nearly forty miles from the sea, and invested on every side with jungle and morass. The tide overflows the flat borders of the river to a considerable extent. Its reflux converts these into a noisome swamp; and in this swamp, strange to say, great part of the town of Arracan is built, the water flowing under the houses, which are raised on posts, after the manner of the Mughls, Birmahs, Malays, and other eastern nations.

The prevailing diseases amongst the Sepoy troops stationed in this place have been described by Dr. Mac Dougall* as consisting of obstinate intermittents and bilious remittents, and chronic dysentery and diarrhœa, attended with great debility. These appear to be the more frequent forms of disease

With the exception of the swampy ground, the soil consists of rock, crumbling on the surface, and forming itself into gravel, well adapted for roads, or the floors of the houses.

“ There is a gentle inclination of the soil to the neighbouring streams, of which there are abundance, as well as springs of the purest water close to the town. The hills generally assume the conical shape, some being isolated, others connected by narrow ridges, all scattered in an irregular manner, and divided by many deep, ill-ventilated valleys and confined plains, each occupied by a running stream, a lake, or a marsh. None of the hills in the immediate vicinity of Arracan seem to exceed 500 feet in height, but are to be found of all elevations below that. A thin layer of loose black soil, the product, no doubt, of decayed vegetation, covers the mouldering rock; and when this has not been washed away by the rain, grass and jungle-shrubs abound, but few or no trees of any considerable growth, except in the valleys. A range of mountains, fifteen miles to the eastward, and 2000 feet perhaps in average elevation, appears to take a direction nearly parallel to the coast: another range, of much less height, skirts the shore. Between these the distance varies; but in the direction of Arracan may possibly amount to fifty miles. The alluvial plains that intervene are intersected by a labyrinth of small rivers, in communication with the principal channel, which takes a northerly course, and diversified with detached groups and ridges of hills, none exceeding 6 or 800 feet. The surface of these extended plains is partly under rice cultivation, and interspersed with villages, but chiefly occupied, as the hills are, with jungle.

“ While the army under General Morrison was on its march from Chittagong to Arracan (a distance of 150 miles), in the months of January, February, and March last (1825), the weather was particularly favourable, with the exception of occasional heavy fogs. In April and May the heat during the day became considerable. By that time, however, all the officers and European soldiers, and many of the Sepoys, had been comfortably hutted. The rains and sickness set in together in the month of June, but it was not till the following month that both became excessive. From the 20th of June till the end of July, there was scarcely one dry day; and at different periods during the latter month, it rained incessantly for several days and nights in succession. In the course of that period it will be found, I believe, by reference to documents in possession of the Board, that the number of sick in the native corps was nearly doubled, and that the Europeans, who had hitherto resisted the effects of the climate, began to share in the sickness, as also the Madras brigade stationed at Mahatty, five miles to the southward. In the mean time, some of the Bengal regiments of up-country Sepoys had scarcely fifty men fit for duty. It is not improbable, that (besides the causes already mentioned) the

* In the Transactions of the Medical and Physical Society of Bengal, vol. i. p. 190.

usually occurring amongst the native troops when serving in lower, moister, and warmer countries than those of which they are the natives; and are no more peculiar to this particular place than to the low districts in the east and south-east of Bengal, in Arracan, in Rangoon, and other parts in the south of

moderate use of spirits, superior diet, clothing, and accommodation, lighter duty, and less exposure, may concur in explaining this partial exemption from the prevailing malady on the part of the European soldier; and some of the above circumstances, with the difference of situation, may possibly account for the lateness of its attack on the Madras troops, among whom its ravages were latterly equally severe. It may here be observed, with reference to the rainy weather throughout July, that our experience seems to be rather at variance with the common opinion of the general salubrity of a country immersed in water; but when we take into consideration the jungle-covered hills, on which no water can long rest, as a fertile source of pestiferous miasma, the apparent contradiction is perhaps sufficiently explained. By the middle of July, therefore, the sickness had become universal; many officers were now on the sick-list, and their servants also being useless from sickness, their situation, from want of attendance, was often distressing: medical officers in particular, from their continued exposure, fatigue, and anxiety, suffered severely. Of the first five deaths that occurred in the army, four were in the medical department. Public establishments, and camp followers of every description, having no hospital to resort to, fell ready victims; and it was common to see many poor wretches stretched dead or dying on the road, or their bodies floating down the stream. Cattle, too, began to be in the same deplorable state. The camels, with the exception of one or two miserable skeletons still retaining life, had all perished. Horses, elephants, and bullocks, were diminishing daily. The hardy little Birmah ponies alone, ill-fed and harassed as they were, continued healthy. With regard to the Mugh population, most of those who had hitherto been employed as coolies obtained leave to cultivate their fields: of those who remained in the town, it did not appear to me that many were sickly; and there is no doubt that the men of the Mugh levy, serving with this force, experienced no remarkable degree of sickness.

“As we are but little acquainted with this race of men, a few remarks on them may not be unacceptable. In external appearance the Mugh is of moderate stature, and very robust: the face broad, cheek-bones wide and high, nose flat, and eyes somewhat oblique, like those of the Chinese. He differs not more from his effeminate neighbour of Bengal in form, feature, and physical strength, than in general habits, particularly in regard to diet. Though, like the Birmah, he stands upon some punctilios in taking the life of any animal for the supply of food, he is at all times ready to devour such as have been killed, or died of disease. From the rat to the elephant inclusive, there is hardly any animal food too gross for the palate of a Mugh. Some species of maggots, and a variety of the vegetable products of every jungle, are said to form a meal, where nothing better is procurable. In short, it is almost impossible to suppose a situation, except absolute confinement, where an individual of this race would starve. Besides being a most gross feeder, the Mugh is addicted to personal filthiness and to indolence,—faults to be expected in the present semi-barbarous state of his country.”

India. With respect to the influence of changes of climate upon the health of the Sepoy, we shall have to speak of it towards the conclusion of this work, when the particular subject of change to a more marshy, a lower, and warmer climate, with the consequences, will be fully discussed.

The same conditions of soil, situation, and climate, which have been now adduced respecting Chittagong and Arracan, may be considered as present at Rangoon. The position of this place on one of the mouths of the Irrawaddy river, and on a low and swampy delta, consisting entirely of a deep, rich, and alluvial soil, covered in many places with a dense jungle, and at one period of the year either wholly inundated or a complete marsh, is sufficient to shew its great insalubrity, and the kind of diseases with which it is usually infested. Being five degrees nearer the equator than Arracan, its temperature is in a slight degree more equable, and the annual mean somewhat higher; but the air is generally more moist, and the weather more variable. The nature and great extent of the services required of the troops in the late expedition to this part of the East, the privations to which they were exposed, and the kind of food on which they were obliged chiefly to subsist, tended, conjointly with the endemic causes of disease, as will be fully shewn when the particular forms of disorder there observed are considered, to the extension of sickness amongst the Sepoys as well as Europeans.*

* The following extracts from Dr. Burke's Report to the Director General of the Medical Department of the Army, kindly and liberally furnished us by Sir James M'Grigor, will illustrate farther the nature of the climate of Ava, and its effects upon the European constitution, and upon the natives of the more, northerly and higher provinces of Hindostan.

"At Ava, as here in Bengal and Southern India, the climatic year may be divided into the cold, the hot, and the rainy seasons.

"The cold season commences in Ava with November, and ends in February: this time is pleasant and healthy.

"March and April are the hottest months, yet perhaps there is a greater thermometrical range than at any other period; the thermometer rising to 98°, or 101°, at two or three o'clock P.M., while at four or five o'clock A.M. it is at 72° or 75°. The grateful coolness of the nights, by admitting of sound and refreshing sleep, makes large compensation for the languor and oppression experienced from the heat of the day. The air is excessively dry during the hottest part of the day. The wind not unfrequently occurs all round the compass, forming whirlwinds of dust.

"The first showers fall in May: about the middle of June the regular rains may be said to be

The situation and climate of the place and adjoining country are such as will always be productive of disease among Europeans, and Sepoys, natives of the higher countries of India, more particularly during and after the rains. In the late expedition, the badness of the provision, and the difficulty of procuring any

set in. In the rainy months the mutations of temperature are frequent and sudden; the air is hot, moist, and close; an atmosphere of steam seems to float around us, and people breathe as if immersed in a vapour bath. All at once, the sky is overcast, the rain descends heavily, accompanied with a cold rushing wind, and the thermometer sinks 10° or 12° . A damp, unpleasant chill is the consequence, and people are compelled to lay aside their light cotton for their woollen clothing. Again, the rain ceases, the sun breaks forth, and the close and sultry weather returns.

“ In such a season, it is obvious that troops engaged in active military operations could not long withstand the encroachments of disease; and so it happened with the troops who, during it, arrived in Ava, and commenced operations there; but from the account of all employed, there are to be taken also into consideration, as an additional cause of disease, the privation of the men and the state of their provisions. For the means of subsistence it became necessary to issue salt meat, biscuit, and rum, (which the shipping afforded,*) in daily rations to the troops. The quality of the two first, and most essential articles, are stated to have been unfortunately of the worst kind: upon such a diet as this, *unprovided* with *any* of the corrigents of salted food, and exposed to harassing and fatiguing duties, in an inclement season, as well by night as day, disease was inevitable; even the hospital diet-rolls for *months* exhibited only a meagre account of sago, arrow-root, some tea and sugar, as nearly the whole sustenance of the sick.†

“ The principal diseases which afflicted the Europeans were fevers, intermittents, and remittents, dysentery, cholera, scurvy, and scorbutic dysentery.

“ On the change of season, and the beginning of the cold weather, the general sickness began to decline; but the change, it was observed, brought no relief to those with chronic dysentery, and but few of the patients who remained in the country appear to have attained robust health.‡

“ On the period this quarterly return§ commences, the 21st December, 1825, His Majesty's 13th, 38th, and 47th regiments were advancing to the city of Ava or Amurapura, having halted at Meady during the rainy season. On the 30th December they reached Putanaga, and were encamped in a low jungly position, with high grass. On the night of the 31st December, cholera,

* It would appear from this, that necessity obliged them to use salt meat; that it was not laid in expressly for the troops, but the usual ship-supply for themselves.

† We do not think this was bad food for men affected with dysentery and fever.

‡ The necessity of moving convalescents and chronic cases to healthier stations is evident from this.

§ See the Return in the Appendix.

other than salted meat, gave rise to different forms of disease among Europeans from those which usually manifest themselves in India, under the circumstances in which troops on service are generally placed, and tended to heighten the danger of the disorders resulting from marsh effluvia, to increase the debility attending them, and to occasion other forms of disease besides those which the locality and climate necessarily produced. The scorbutic dysentery, the bad forms of fever, the ulcers on the extremities, the tendency to gangrene and ulceration after slight causes, &c. were the ultimate effects of the conjoined influence of fatigue, exposure to concentrated terrestrial exhalations, and salted, unwholesome, or inappropriate food,—as we shall have to shew when those varieties of disease come under consideration.

Climate of Java, &c.—The subjoined observations respecting the climate and seasons of Java, from the very interesting work of Sir Stamford Raffles on that island, are also in a great measure applicable to the other islands within twelve degrees of each side of the equator.* The situation of Batavia, at the head

in its worst form, suddenly attacked them, and for 24 hours had a most alarming appearance; when it as suddenly disappeared, on their moving their camp to a dry, elevated situation, and clear of grass. A fever of the remittent type then appeared among the men, which, as noticed by the Surgeon of His Majesty's 38th regiment, he found of the most concentrated form, and attended with yellowness, and all the severe symptoms of the fever of the West Indies, where he, Mr. Cathcart, had long served. The 38th, it is stated, lost six cases, who had been seized with this fever, from the 30th December to the 1st January, beside others who had been ill previously to their arrival there.

“ In the 13th regiment there were eight cases of cholera, five of which proved fatal. On the 22d January this regiment sent sixteen men, of fever and bowel complaints, to the rear, of which five died. Dr. Henderson did not expect these deaths, as the cases were not severe, and they were actively treated at the commencement. The field hospital was not good; but this could not be helped.”

* “ The seasons, in all the countries situated within about ten degrees of the equator, agree in this : that as one eternal summer prevails, they are not distinguished as hot and cold, but as wet and dry. On Java the seasons depend upon the periodical winds. The period of the setting in of these winds is not determined within a few weeks ; but generally the westerly winds, which are always attended with rain, are felt in October, become more steady in November and December, and gradually subside, till in March or April they are succeeded by the easterly winds and fair weather, which continue for the remaining half year. The heaviest rains are in the months of December and

of a bay, in which are scattered several low, muddy islands,—the circumstance of its being intersected by canals filled with foul and nearly stagnant water, and surrounded by sluggish rivers with low, muddy banks and mangrove bushes, in which are continually floating dead and putrid animals, which are frequently

January, and the driest weather is in July and August; at which latter period, also, the nights are coldest and the days hottest. The weather is most unsettled when the season is changing, particularly at the first setting in of the westerly winds: but those violent storms and hurricanes, which are so often felt in the West Indies and in higher latitudes, are here unknown. With the exception of a few days at these periods, or when the westerly winds are at their height, vessels of any description may ride in safety, in most of the bays along the northern coast of the island; and on shore the wind is never so violent as to do damage. Thunder-storms are, however, frequent, and the lightning is extremely vivid. In the vicinity of the hills and elsewhere, during the dry season, seldom a day passes without thunder and lightning; and although these grand exhibitions of nature cause less consternation in general within the tropics than beyond them, it cannot be denied that they are destructive of many lives. Earthquakes are to be expected in a volcanic country, and are frequent in the vicinity of the volcanoes; but the European towns have never sustained any serious injury from them.

“ During the rainy season there are many days free from showers. The mornings are generally clear; and although the rains sometimes continue without intermission for several days, and frequently fall in torrents, they are not marked on Java by that decided character, either of permanence or violence, which distinguishes the periodical rains of the continent of India; neither is the dry season distinguished by that excessive aridity which attends the hot seasons of that country. Even in July and August, the atmosphere is refreshed by occasional showers, and the landscape is at all times of the year covered with the brightest verdure. The thermometer of Fahrenheit has been known to rise along the northern coast as high as 90° about three in the afternoon, and even higher, particularly in the large and low capitals of Batavia, *Semarang*, and *Surabaya*; but from observations made during a course of some years at Batavia, and published under the authority of the Dutch government, it has been found usually to range between 70 and 74° in the evenings and mornings, and to stand about 83° at noon. By similar observations at *Semarang*, the same thermometer, placed in a spacious and open apartment, has averaged $87\frac{1}{2}^{\circ}$ at noon.

“ At a distance inland of not more than thirty or forty miles, where the ascent is gradual, and of fifteen or twenty, or less when it is rapid, the thermometer falls from five to ten degrees lower. At *Chi-serua*, situated about forty miles inland of Batavia, and *Chi-panas*, about twelve miles further, on the opposite slope of the mountain *Gedé*, the thermometer ranges generally between 60 and 70° . In the morning, at six o'clock, it is sometimes as low as 57° ; and in the afternoon, at three, its usual height is from 67 to 70° , but seldom rising to 72° . On some of the hills inland of *Semarang*, on which Europeans frequently reside during the dry season, at an elevation of about four thousand feet, the thermometer is frequently seen as low as 45° , and generally, in the clear

left upon the adjoining banks, — the low and woody jungles, and swamps with stagnant pools and tanks, every where surrounding this, in other respects, splendid city, and the badness of the water in constant and general use, combine to render this place extremely injurious to European constitutions, and to the

season, ranges from 50 to 62°, and on the summit of one of the mountains (*Sindóro*) it has been observed as low as 27°. Ice, as thick as a Spanish dollar, has been found; and hoar frost, denominated *bóhon úpas*, or the poisonous dew, has been observed on the trees and vegetation of some of the higher regions.

“ By its insular situation, the climate of Java enjoys the benefit of land and sea breezes, which, in its least favoured parts, subdue the fierceness of the tropical rays, while the great elevation of its interior affords the rare advantage, that from the sea-shore up to the tops of the mountains there is, almost from one end of the island to the other, a regular diminution of the temperature, at the rate of two or three degrees of Fahrenheit for every ten miles.

“ The general inference which has been drawn by professional men, from the experience which the occupation of Java by the British has afforded, is, that with the exception of the town of Batavia, and some parts of the northern coast, the island of Java stands on a level, in point of salubrity, with the healthiest parts of British India, or of any tropical country in the world.

“ The principal stations of the British army, composed of Europeans and Sepoys, were at Weltevreden, within three miles of the town of Batavia, and at *Semárang* and *Surabáya*, spots certainly less favourable to health than the rest of the island taken generally; but detachments from it have occasionally done duty in every district of the island.

“ The tables included in the Appendix will shew, that notwithstanding the troops laboured under many disadvantages and privations, in point of accommodation, &c. to which they would not have been subjected in a more permanent settlement, and that they were otherwise exposed to diseases unconnected with those of the climate, the average casualties were not excessive. From the 1st of November 1813 to the same month in 1814, the average number of troops is stated to have been 7,470, the deaths 504, making a proportion of 1 to 14·8: the average number of sick in the same period was 862, making a proportion of sick to well as 1 to 8. From the beginning of November 1814, to the same month in 1815, out of an average number of troops stationed in different parts of the island, in corps and detachments amounting to 7,487, there were 252 deaths, 63 of which were caused by fever, 123 by dysentery, and 65 by other diseases, making an average number of deaths of 21 per month, or in the proportion of one death to thirty men in the year, — a proportion not exceeding that of some of the healthiest possessions in temperate climates.

“ That the climate of Java, in general, is congenial to the human frame, at least to that of an Asiatic, is corroborated by the great extent of its native population, compared with that of the surrounding islands, notwithstanding the checks which it experienced both from the native princes and the European government; and the convincing proof which the records of the British army now afford,

natives of higher latitudes. The insalubrity of Batavia is also in a great measure owing to the exhalations from the soil being heightened by the addition of large quantities of animal matter in a state of decay, to which the circumstances connected with a large city give rise. So remarkably were

are perhaps sufficient to remove the unfavourable impression which existed against the climate of the island, as affecting Europeans.

“ At the same time, however, that Java has to boast this general character of high salubrity, comparatively with other tropical climates, it is not to be denied that there are some spots upon it which are decidedly unhealthy. These are to be found along the low swampy marshes of the northern coast, which are mostly recent encroachments upon the sea: the principal of these is Batavia, the long-established capital of the Dutch eastern empire.

“ The climate of this city has ever been considered as one of the most baneful in the world. It has even been designated the storehouse of disease; with how much justice, is too wofully demonstrated by the writings of those visitors who have survived its perils, and the records of the Dutch East-India Company itself. If we may credit Raynal, there perished, between the years 1714 and 1776, in the hospitals of Batavia, above eighty-seven thousand sailors and soldiers. From the table, No. 1, imperfect as it is, on account of the loss of many of the registers at the period of the British conquest, it will be seen what a large proportion the deaths bore to the whole population; and from the table, No. 2, of the same Appendix, discovered among the Dutch records, it appears further, that the total amount of deaths in this city, from the year 1730 to the year 1752, was, in twenty-two years, more than a million of souls.

“ To those who are acquainted with the manner in which the affairs of the Dutch East-India Company were managed abroad, there will perhaps be no difficulty in laying rather at the door of the colonists, than of the nation, the crime of maintaining a commercial monopoly, at such a dreadful expense of lives as resulted from confining the European population within the narrow walls of this unhealthy city. That the sacrifice was made for that object, or to speak more correctly, under that pretext, for the private interests of the colonists who were intrusted with its details, can scarcely be doubted. From the moment the walls of the city were demolished, the draw-bridges let down, and free egress and ingress to and from the country was permitted, the population began to migrate to a more healthy spot, and they had not to go above one or two miles beyond the precincts before they found themselves in a different climate. But this indulgence, as it gave the inhabitants a purer air, so it gave them a clearer insight into the resources of the country, and notions of a freer commerce, which, of all things, it was the object of the local government and its officers to limit or suppress.

“ Necessity might have first determined the choice of the spot for the European capital; but a perseverance in the policy of confining the European population within its walls, after so many direful warnings of its insalubrity, cannot but lead to the inference, that either the monopoly of the trade was

those causes productive of the usual endemic diseases, on the conquest of Batavia in 1811, and so injurious to the vital energies of the system, that the troops which were stationed at Fort Cornelius after that fortification fell, were much more sickly than the troops at Weltevreden, and the smallest scratch or wound speedily degenerated into gangrene and foul ulcers; while the wounds of those at the latter place recovered in the usual way,—a circumstance arising from the low situation of the former, and much more elevated position of the latter.* Bettensog, which was much farther up

considered a greater object to the nation than the lives of the inhabitants, or that the more liberal views of the government were defeated by the weakness or corruption of its agents.”

“ Passing by other occasions, there exists on the records of the High Regency a reply to queries about the unhealthiness of Batavia, dated the 14th of October, 1753. This paper states, that between 1732 and 1738 the greatest number of casualties happened. It assigns as a great cause of the insalubrity complained of, the situation of the town in a bay, confined on the west and east by projecting points of land, and enclosed in front by a cluster of small islands. The space between the town and the sea is chiefly mud, left by the retreating of the sea; a swamp surrounds the town. The mouths of the rivers are generally covered with underwood and a species of tree peculiar to swamps. The vegetation of these low grounds, it is added, cannot but retain impurities of the most noxious kind. The space which is formed at the mouths of the rivers *Táng’ran* and *Ang’ki* is an entire swamp, covered with shrubs, which emit exhalations of an impure nature: these are interspersed with the burying-grounds of the natives, and the effluvia of these places is felt at some distance. It was believed that the earthquake of 1699, by forcing mud from under the earth, and blocking up the mouths of the rivers more than formerly, contributed to increase the previously existing unhealthiness. The lime-kilns in the neighbourhood, the close plantations of trees that prevent a free circulation of air, the stagnation of the rivers from the bars of mud or sand which obstruct their outcourse into the sea, the kind of water which the inhabitants are compelled to drink, the narrowness of their houses, and the dirt and filth accumulated in the numerous canals that intersect the town, have all their due share of pernicious efficiency assigned them in this report. The buildings, it is said, are admirably adapted to keep out the fresh air, and to retain that which is putrid or noxious. To remedy the evils felt, a new construction of houses is recommended, and a frequent pruning or entire extirpation of the trees.

“ The fever which excited this inquiry commenced in 1733, and lasted till 1738, and during its continuance two thousand of the company’s servants and free Christians annually died. In 1739 its violence abated; but it broke out again in 1744, and continued with little diminution or variation to the date of the report in 1753.”

* The following report, given in the work now quoted, so perfectly agrees with our own observations made at Batavia on the same expedition, and so fully illustrates and corroborates our own statements, that we shall quote it without abridgment.

the country, and free from the circumstances operating at Batavia, was remarkably healthy, as was shewn by the rapid convalescence of the sick removed to this place, according to our directions when in charge of the military hospitals, on the capture of the colony. The prevailing diseases

“ ‘ Such is the melancholy instance of the noxious climate of Batavia which came within my own observation. That it was not epidemic is clearly evinced, from its not extending its influence to those who attended the sick, nor to the rest of the crew, all of whom escaped its attack, and remained healthy. Among the Dutch who remain in the town, fevers are, I understand, very prevalent at all seasons, notwithstanding their being in a manner inured to the climate, and most of them have a sallow, sickly appearance. It is not uncommon, in riding through the streets, to meet three or four funerals daily.

“ ‘ The Chinese, however, who are very numerous, suffer more than any class of the people ; perhaps from the worse situations of their houses, the manner in which these are crowded, the closeness of their apartments, and their gross manner of living. The number of casualties among them, I am told, is incredible, especially during the dry season ; and if one may judge from the extent of their burial-ground and the number of their tumuli, it cannot admit of a doubt.* The preceding facts are, I conclude, sufficient to establish the truth of the noxious character the climate of Batavia has so long obtained, and I shall now proceed to the causes which have been often investigated, and seem well ascertained, though the knowledge of them has led to little exertion for their removal.

“ ‘ The baneful effects of marsh miasmata on the human system are well known, engendering intermittent and remittent fevers, dysenteries, and visceral obstructions. Batavia, built almost in a swamp, surrounded by marshes in all directions, trees, and jungles, which prevent the exhalations being carried off by a free circulation of air, is peculiarly obnoxious from this cause. Opposite the mouth of the river, and extending a great way to the westward, is a mud bank, which in many parts, at low water, is uncovered by the sea, and is daily accumulating, from the quantities of mud and animal and vegetable matter carried down by the river during its reflux. Again, the sea often at spring-tides overflows the adjacent country, and, on its receding, leaves the soil covered with slime and mud, which, exposed to the action of the sun, soon suffers decomposition, and impregnates the atmosphere with its noxious exhalations, which are carried by the sea-breeze over Batavia, where the trees and jungles surrounding the houses prevent their being dissipated.

* The Chinese always bury in hills, or rising grounds, from their bases to their summits, and they never inter more than one body in the same grave ; hence the great extent of their burying grounds. That at Batavia is very extensive ; but in a great degree it is owing to this circumstance. A similar remark is applicable to Malacca, and indeed to all places where the Chinese settle.

were remittent and bilious fevers of a severe type, and characterised by great prostration of the vital energies,—remittents of a formidable type often becoming remittent, and terminating in organic lesions,—dysentery often complicated with fever and disease of the liver,—chronic diarrhœa, and obstinate ulcers and gangrene.

During the heat of the day, these exhalations are more diffused and comparatively innoxious; but when the sun withdraws its influence, they become more condensed, and amalgamating with the descending evening dews, form a morbid atmosphere around the houses of the inhabitants. This hypothesis will readily account for a fact well known, that people whose commercial concerns require their presence in Batavia during the day, and who retire during the night into the country, escape this endemic, while scarcely any who sleep in the town, even for a night, unless those who by a long residence are inured to it, escape.

“ ‘ A second, and I think an equally powerful cause, is the stagnant water of the canals, which in all directions intersect the city. In the first place, they are filled with filth of every description; there is scarcely, at times, any perceptible current in them to carry off that filth; and lastly, the sluices are frequently kept shut, for the purpose of swelling the waters above them to irrigate the fields, while those below, which intersect the town, become almost dry, leaving an extensive surface of mud and every kind of putrefied matter to be acted upon by the sun, raising the most pestilential vapours, with which, as before observed, the atmosphere gets thoroughly impregnated.

“ ‘ As a third cause, the state of the houses may be considered, and the mode of living of the Dutch. Houses that are untenanted are seldom opened, and thus collect much filth and foul damp pernicious vapours. Those that are inhabited are generally shut up in the daytime, most of them being glazed, thus preventing a free circulation of air; and in the lower story of most of the houses, the walls are covered some feet from the ground with a greenish coat, and on entering the apartments a stranger experiences a kind of chilly feel and a damp raw kind of smell. Although it cannot be enumerated among the causes, yet I cannot help thinking, the Dutch mode of medical practice, in as far as it is inefficient to counteract the diseases of this climate, must tend to increase the number of fatal terminations.

“ ‘ A fourth, and I am convinced a very general cause, especially of the diarrhœas and dysenteries which seldom fail to attack new comers, is the water. This most essential article is taken either from the canals or wells, and it is equally bad when passed through a filtering stone. It retains a brackish, hard, unpleasant taste, and, if allowed to remain some time in vessels without previous boiling, generates small animalculæ. Such, I conceive, are the most probable and principal causes of the insalubrity of Batavia; though there are, I doubt not, others contributing, which elude observation. It is a generally received, though I think an erroneous opinion, that the rainy season is the most unhealthy. The most unhealthy appears to me to be that immediately after the cessation of the rains; and the older and more experienced Dutch residents have observed, that in years when there has been a long-continued drought, disease has been more than usually prevalent,

Isle of France.—This is one of the most healthy and pleasant islands beyond the Cape of Good Hope. The thermometer seldom falls below 70° , or rises above 88° : the annual mean temperature is about 77° . The south-east are the prevailing winds; and gales are frequent about the times of the equinox. During January, February and March, there is generally much rain, and gentle showers fall during April, May, and June. The first four and the last two months of the year are the warmest months. According to the official returns, kindly furnished us by the Director-General of the Medical Department of the Army, the annual per-centage of nominal admissions of the European troops into hospital, averaged, during a period of three years, $18\frac{3}{4}$ per cent of fevers, $14\frac{2}{3}$ per cent dysentery, and $17\frac{2}{3}$ per cent hepatitis, in the effective strength of the corps. Most of the cases were slight: the deaths of fever only averaged about 1 per cent in the nominal admissions, of dysentery about 5 per cent, and of hepatitis 3 per cent. From these returns it appears that, although this is one of the most healthy places in the East, yet it is as much subject to hepatic disorders as any other place in India. Indeed, it would seem that hepatitis prevails throughout the eastern hemisphere in a very marked manner: wherefore it should be more prevalent in the eastern than in the western hemisphere, cannot, in the present state of our knowledge, be satisfactorily explained.

and they look forward with anxiety for the accession of the rains, as the means of resisting its baneful dissemination.

“ ‘ Weltevreden, at a distance of not more than three miles, being less exposed to these causes, excepting the water, is exempt, in a great measure, from its prevailing endemic fever; though diarrhoeas are common, especially among those newly arriving, but they are seldom of a serious or alarming nature.

“ ‘ Among the troops stationed at Weltevreden and Cornelis, diseases are not more frequent than in the healthiest parts of India which I have visited; though for some months since the Bâli expedition, the casualties in the 78th regiment have been numerous. At *Chemangis*, about twenty-two miles from Batavia inland, a battalion of Sepoys is stationed, where, from the returns I have received, it appears they enjoy comparatively good health, and have very few casualties, though a much larger quantity of rain falls than in the vicinity of Weltevreden. It is on an elevated commanding situation, and open and clear of jungle for a considerable extent around.’ ”

SECTION III.

Remarks on the Climate, Seasons, and Salubrity of the Colonies on the Coast of Africa, and in the West Indies and Mediterranean.

WITH respect to this part of our subject, circumstances oblige us to be both brief and desultory. In our observations on the sources of marsh miasmata, &c. we have already pointed out the chief causes of the endemics of the countries embraced in the present section; and it will be therefore sufficient merely to state at this place, that these causes exist in many of the colonies and settlements which will now be spoken of, in a most concentrated and pestilential form, and in some others in a more mild and less noxious degree. Of the former, the west coast of Africa and some of the West India Islands furnish the most convincing and most distressing proofs; of the latter, the Cape of Good Hope, and one or two stations in the Mediterranean, are more pleasing instances.

COAST OF AFRICA.

Cape of Good Hope.—The thermometer is seldom below 48° of Fahrenheit in the coldest month, which is June, or higher than 90° in January, the warmest month. The mean temperature of this latter month, according to the observations made in 1823 and 1824, is 79° ; of February, 78° ; of March, 74° ; April, 73° ; May, 65° ; of June, 61° ; of July, 63° ; of August, 65° ; September, $67\frac{1}{2}^{\circ}$; October, 73° ; November, 73° ; December, 74° . According to the medical returns of the European troops at Cape Town for the years 1823, 1824, and 1825, the annual average per-centage of disease was as follows:—fevers, 10; pulmonary complaints, 11; dysentery, 9; hepatitis, 3; diarrhoea, 2. The number of deaths in the nominal admissions was $2\frac{1}{3}$ per cent in fevers, $3\frac{1}{3}$ per cent in pulmonic ailments, $2\frac{1}{3}$ per cent in dysentery, and 2 per cent in hepatitis.

Cape Coast Castle and Acra.—On this part of the coast of Africa, (the Gold Coast of Guinea,) the winds are generally from the south-west through the day during the whole year. Being so near the equator, the temperature is generally uniform, seldom being below 72° , or above 86° . The monthly mean of the thermometer ranges from 75° to 82° . January, February, March, and April, are the warmest months, the coldest being August, September, and October, immediately following the rains, which commence in May. The months of May, June, and July, are the great rainy season, to which succeed about two months of foggy and close weather, with occasional rain. During the months of October and November are what is usually called the after-rains. During the rainy seasons, tornados are very frequent along the whole of this coast.

The whole country on the sea-coast, and for many miles inland, is low, with gentle undulations of surface in some places, and completely covered with a thick and impenetrable jungle, and with the cotton and other large trees, interspersed with swamps and patches of rice-grounds. The rain, which falls in torrents during May, June, and July, renders the whole of the low grounds a complete marsh; and its evaporation during the day in the state of vapour, carrying along with it the exhalations proceeding from the decay of the vegetable and animal remains with which the thick jungles abound, gives rise to dense fogs, which are precipitated during the nights and mornings by the cold land winds which blow at that time. The air at last becomes loaded with the moisture given off from the inundated and marshy grounds beyond its capacity of retention, and hence the rains which fall during October and November, and which have received the name of the little, or after-rains. The month of December is also foggy and sultry, owing to the same phenomena supervening upon the after-rains as marked the termination of the great rains.

According to the medical returns of an European corps consisting of 451 men, there were during 1824, 358 nominal admissions of fever, 345 of dysentery, 17 of hepatitis, and 87 of diarrhœa. Of these, 131 died of fever, 57 of dysentery, and 3 of hepatitis. During nine months in 1825, the nominal

admissions from a corps of 390 Europeans were 206 fevers, 74 dysentery, 7 hepatitis, and 16 diarrhœa. Out of these, 36 died of fevers, 28 of dysentery, 2 of hepatitis, and 1 of diarrhœa. The deaths occurred chiefly amongst those recently arrived in the country, or who had resided in it under eight or nine months. It will be seen that the prevailing diseases were fever and dysentery of the most malignant and dangerous character, owing to the endemic sources of disease being most productive, and the terrestrial exhalations most concentrated. It is probable that the usual foulness of the water at this settlement contributed much to the prevalence of dysentery, as none else can be procured but from tanks, and it is often loaded with animalcules, and is otherwise offensive.

Sierra Leone, Gambia, and Isles de Loss.—The seasons and climate of Sierra Leone differ but little from those of Cape Coast on the Gold Coast. According to the medical returns of the European corps sent to this colony early in 1825, the *nominal** admissions from May to December inclusive, out of an effective force which never exceeded, during these months, 1150, were as follow :—fevers, 1120, out of which number 378 died within the above period; dysentery, 116 nominal admissions and 26 deaths; hepatitis, 107 nominal admissions and 5 deaths; and diarrhœa, 88 admissions and 3 deaths. The total *nominal* admissions of these diseases during eight months were 1431, and 412 deaths. The few cases of dysentery at Sierra Leone, compared with the frequency of this disease on the Gold Coast, seems to be owing to the excellency of the spring water, which is so abundant at Sierra Leone, and to the foulness of the water at Cape Coast. It is stated in the returns, that the whole of the deaths were recent arrivals, none of the men having been in the colony above a twelvemonth.

During the third quarter of 1825 only, the deaths amounted at Sierra Leone to 182 out of 900 men; at Gambia, to 57 out of 100 men; and at the Isles de Loss, to 23 out of 100 men!

* See the explanatory note at pp. 120, 121.

In the last quarter of the same year the deaths were 46 out of 522 men, at Sierra Leone; 74 out of 147 men at Gambia; and 10 out of 72 at the Isles de Loss.

From these returns, as well as from the best sources of information, we are authorised in stating, that the British settlements on the west coast of Africa are, and always have been, the most fatal to Europeans of any in the whole globe. The extent of disease has been carefully concealed, or artfully misrepresented, whilst they remained under the dominion of interested trading companies. But since they have come under the immediate cognizance of the government of the country, they begin to be viewed in a proper light. We may also state, that the foreign settlements, which came into our possession during the late war, and which were restored at the peace, are by far the most healthy on the west coast of Africa. In this country, where malaria is the most productive of disease of any part of the world, the negro inhabitants suffer under little or no disease, unless when dysentery becomes epidemic, or when visited by small-pox. The prevailing diseases amongst Europeans are, all the forms of fever known to occur in warm climates, dysentery, diarrhoea, hepatitis, and splenitis. The last-named disease is very frequent on the Gold Coast.

WEST INDIES.

Demerara, Berbice, and Esquebo, are situated in one of the most unhealthy districts on the South American coast, on a low, swampy, and jungly soil, near the banks of rivers, and where all sources and conditions most productive of the marsh-effluvium, in its worst form, abound. During the first six months of the year, easterly winds prevail, with constant and heavy rains. During the months July, August, and September, the winds become more variable, with cloudy and showery weather. The last quarter of the year is generally fine, and dry. The extreme range of the thermometer is very limited, seldom falling under 77°, or rising above 87°. The monthly mean temperature varies

from 80° to 83° of Fahrenheit. The annual mean is about 82°. The yearly fall of rain is very great, and has been calculated at from 80 to 90 inches. According to the medical returns of the European troops at the above settlements, the annual *nominal* admissions of fevers in the effective strength were, 183 per cent of fevers, 14 per cent pulmonary ailments, 12 per cent dysentery, 2 per cent hepatitis, and 6 per cent diarrhoea. The per-centage of deaths in the nominal admissions was, 4 in fevers, 8 in pulmonary complaints, 4 in dysentery, 14 in hepatitis, and 1 in diarrhoea. The high per-centage of pulmonary complaints is here remarkable. Although this is one of the most unhealthy climates as respects the European constitution, yet it would appear, from the official returns, that it is healthy as regards the black troops, little or no sickness occurring amongst them, and that of a slighter description. From these returns it appears, that fevers which vary their types according to the situation and season, are the most prevalent diseases among the European residents.

Trinidad. — The island possesses all the more important conditions on which the production of marsh-exhalations depends, as shewn in the section on this efficient cause of intertropical diseases. The temperature near the coast of the island varies from 65° to 95°, and presents a greater variation than almost any other of the islands, excepting the interior of Jamaica. The monthly mean temperature ranges from 75° in February, up to 81° in May. From this month till November it varies from 79° to 80° and 81°. The annual mean may be reckoned at 79°. The winds are from the east nearly all the year, varying from north-east to south-east. February, March, April, and May, are dry months. June, July, August, and September, are very rainy, and thunder-storms are frequent. From September to February the weather is showery and cloudy, with thunder and lightning.

According to the medical returns for the years 1823, 1824, and 1825, the annual average of *nominal** admissions, in the European effective strength, was 90 $\frac{1}{3}$ per cent of fevers, 15 $\frac{1}{2}$ per cent of pulmonary diseases, 12 per cent

* The nominal admissions were not much more than the actual admissions.

dysentery, and 2 per cent hepatitis. The annual average per-centage of deaths in the nominal admissions was, 4 in fevers, 6 in pulmonary diseases, 12 in dysentery, and $10\frac{2}{3}$ in hepatitis. The prevailing diseases amongst the blacks were pulmonary complaints and agues.

Tobago.—The temperature of this island is seldom under 75° , or above 87° . The monthly mean of the thermometer generally ranges from 78° in December and January, to 83° in the middle months of the year. The annual mean is about 81° . The winds are here generally easterly, as at Trinidad, and the seasons are nearly the same as at that island.

According to the official medical returns, the nominal* admissions averaged annually, in the European effective strength, 44 per cent of fevers, $7\frac{1}{2}$ of pulmonary complaints, $18\frac{1}{2}$ per cent of dysentery, 10 per cent of hepatitis, and 27 per cent of diarrhœa. The annual average per-centage of deaths in the nominal admissions was $8\frac{1}{3}$ in fevers, and $1\frac{1}{3}$ in dysentery. The deaths in dysentery generally occurred in old drunkards.

Barbadoes.—The climate and seasons of this island are well known. The annual mean temperature is about $79\frac{1}{2}$ of Fahrenheit, and its extreme variations very slight, the thermometer seldom falling below 73° , or rising above 85° . According to the medical returns of the European troops stationed at this island, for the years 1823, 1824, and 1825, the annual average per-centage of *nominal* admissions in the effective strength was as follows:—Fevers, 30; pulmonary complaints, 17; dysentery, 10; hepatitis, 4; diarrhœa, 46. The number of deaths in the nominal admissions of Europeans, was 2 per cent in fevers, 6 per cent in pulmonary ailments, 7 per cent in dysentery, 4 per cent in hepatitis, and 1 per cent in diarrhœa. The admissions of *blacks* with fevers were extremely few; with pulmonary complaints they were still more numerous than of Europeans, although the number of cases of pulmonary ailments amongst the latter is extremely great, considering the nature of the climate; and with dysentery, hepatitis, and diarrhœa, the admissions of blacks

* The actual admissions were here nearly as high as the nominal admissions.

were considerably under those of Europeans. From these returns it appears, that fevers, diarrhœa, and pulmonary complaints, are the prevailing diseases among Europeans in this island, and pulmonary complaints among the black troops.

St. Lucia.—The temperature of this island is generally equable, the thermometer seldom falling below 70° , or rising above 83° . The monthly mean temperature generally ranges from 72° in January to 79° in June. The annual mean temperature is about 76° . The months of February, March, April, May, and June, are dry. Rains commence in July, and continue, with occasional dry and cloudy days, through the rest of the year. The winds are variable, generally easterly—from north-east to south-east.

According to the medical returns for the years 1823, 1824, and 1825, the annual average of *nominal* admissions, in the effective strength of European troops, were 111 per cent in fevers, 15 per cent pulmonary complaints, 22 per cent dysentery, and 2 per cent of hepatitis. The per-centage of deaths in the nominal admissions was 10 in fevers, 4 in pulmonary complaints, and 8 in dysentery.

Jamaica.—This is one of the most unhealthy islands in the western hemisphere for European troops. What the particular circumstances are which render it so insalubrious, we will not here take upon us to determine. Neither the temperature, seasons, or weather, are of themselves sufficient to account for the fact. The extreme range of the thermometer on the sea-coast is very small, the temperature seldom being below 74° , or higher than 86° . In the more inland and mountainous parts of the island, the range of the thermometer is much greater. The monthly mean temperature generally varies from about 78° in December, January, and February, to 83° and 84° in June, July, August, and September, the annual mean being about 81° . During the months of January, February, and March, there are occasional showers, with strong and regular sea and land breezes along the south side of the island. In April and May the weather is usually dry. From June to October there is generally much rain, with thunder and lightning. In November and December

the weather is generally close and sultry, with showers. In November, 1824, the shock of an earthquake was felt.

According to the medical returns of the European troops in this island, for the years 1823, 1824, and 1825, the *nominal* admissions averaged annually 104 per cent of fevers, 10 per cent pulmonary complaints, 12 per cent dysentery, 7 per cent hepatitis, and 9 per cent diarrhœa. The annual average per-centage of deaths in the nominal admissions was 10 in fevers, 4 in pulmonary diseases, $3\frac{1}{2}$ in dysentery, 20 in hepatitis, and 2 in diarrhœa. Little or no disease occurred amongst the blacks. The year 1825 was more sickly than any of the former years; the per-centage of fevers being 152 in the effective strength, and the deaths 18 per cent in the nominal admissions. The prevailing diseases, as will be seen from the above statement, are fevers, and these generally of the remittent type, with a considerable proportion of pulmonary and bowel complaints. During 1825, the deaths in an effective European force of 2682 men, were 777, of which 623 died of remittent fever. Of these, 95 died at Port Royal, 216 at Up Park Camp, 150 at Spanish Town, 186 at Stony Hill, 62 at Fort Augusta, 31 at Falmouth, 9 at Maroon Town, and 10 at Lucea.

MEDITERRANEAN.

Gibraltar.—The temperature at Gibraltar varies considerably throughout the year. The thermometer is at the lowest (43°) in January, and at the highest (83°) in August and September: the monthly mean ranges from 51° in January to 78° in August and September. The winds are generally from the east and west throughout the year, and often variable. The annual quantity of rain is about 22 inches, two-thirds of which fall in the first and last quarters of the year.

According to the medical returns for the years 1823, 1824, and 1825, the annual average of actual admissions in the effective strength was 19 per cent of fevers, 6 per cent dysentery, 14 per cent pulmonary diseases, $1\frac{1}{2}$ per cent

hepatitis, and 10 per cent diarrhœa. The annual average per-centage of deaths in the admissions was $1\frac{1}{4}$ fevers, 2 dysentery, $2\frac{1}{2}$ pulmonary complaints, 4 hepatitis, and $\frac{2}{3}$ diarrhœa. The introduction of black troops into this garrison was attempted, but many of them died of pulmonary diseases,* as might have been expected.

Malta.—The lowest range of the thermometer in this island is 44° in January, and the highest 86° in August. The monthly mean of Fahrenheit's thermometer ranges from 58° in January up to 82° in August. During the first quarter of the year there are usually strong breezes, with variable winds, and thunder and lightning, also rain and hail. In the second quarter the weather is fair and pleasant, with some rain. During the third quarter there are fresh breezes, and the weather is clear, pleasant, and warm, with thunder, lightning, and some rain, in September. The last quarter is characterised by strong breezes, with pleasant weather and frequent rains and showers.

According to the medical returns for the years 1823, 1824, and 1825, the annual average admissions of fevers in the effective strength was 21 per cent, 13 per cent pulmonary complaints, 3 per cent dysentery, 2 per cent hepatitis, and 5 per cent diarrhœa. The annual per-centage of deaths in the admissions was $2\frac{1}{4}$ in fevers, $4\frac{1}{2}$ in pulmonary diseases, 9 in dysentery, 5 in hepatitis, and 1 in diarrhœa.

Ionian Islands.—The lowest range of the thermometer at these islands is 86° in January, and the highest 90° in August. The monthly mean temperature rises from 52° in January to 80° in August and September. During the first quarter of the year, cold high winds, with cloudy weather, heavy rains,

* Mr. Fraser, principal medical officer at Gibraltar, states, that during the year 1811, while the 4th West India regiment (black troops) were stationed in that garrison, out of 31 deaths, 24 were pulmonary affections. His words are these :—"Pneumonia has been not only severe in individual instances among the whites, but also distressingly fatal among the negroes. Of a total of 14 deaths from this disease in the garrison, during the half year from January to June, 10 were blacks; and in the succeeding half year, out of 28 deaths, 17 were in the same regiment, and 14 of these died of pulmonary diseases."

and some thunder and lightning, prevail. The second quarter is cloudy, and clear, occasionally, with brisk breezes and some rain. During the third quarter the weather is usually sultry and clear, with some showers, and thunder and lightning. The last quarter is very variable, sometimes clear and fine, at other times showery and boisterous.

According to the medical returns for the years 1823, 1824, and 1825, the annual average of *nominal* admissions in the effective strength, was 51 per cent of fevers, 9 per cent of pulmonary diseases, 4 per cent dysentery, 2 per cent hepatitis, and 7 per cent diarrhœa. The annual per-centage of deaths in the nominal* admissions were, $2\frac{1}{2}$ in fevers, 3 in pulmonary diseases, 7 in dysentery, and 5 in hepatitis.

SECTION IV.

Remarks on the Diet and Regimen usually adopted by Europeans on their Arrival and during their Stay in India and in Warm Climates generally, tending to shew how far they may be viewed as predisposing and exciting Causes of Disease.

HAVING discussed the more efficient causes of disease in warm climates, and considered them, first, as respects their general sources and modes of operation on the European constitution; and, secondly, with respect to the conditions and circumstances under which they present themselves in particular situations and localities, as far as we could obtain the information, either from personal observation or authentic authorities; and having combined whatever know-

* The nominal were not much more than the actual admissions, generally in the proportion of 15 of the former to 13 of the latter.

ledge we possessed of localities, with observations on their temperature, winds, weather, and seasons; having exhibited also the results of the whole upon the health of the troops as shewn by the medical returns of the British forces in each quarter of the globe,—we next proceed to inquire into some of those prominent causes which predispose the system to be acted upon by the more energetic agents of disease, which occasionally co-operate with them towards the production of morbid action, and which, not unfrequently, are of themselves productive of disorder.

In order to comprehend fully the nature of those changes which constitute disease, it is essential to possess an adequate idea of the healthy functions of the system. In the first chapter of this work we attempted to give a succinct view of the present state of our knowledge of the functions of those organs which are more especially affected in the diseases of warm climates, so that the reader might be the more able to comprehend the operation of those causes which generate such diseases, and thus be led to adopt measures for their counteraction, as well as for the removal of their effects. The most generally prevalent and the most efficient cause of intertropical disease is, as we have already shewn, terrestrial exhalation, or malaria, in different forms; the next to this is the mode of living adopted by Europeans generally.

As we consider that diseases in warm climates, and in India in particular, are very frequently dependent upon plethora, it may not be unimportant to shew how this condition of the vascular system is brought about. It has already been stated, that if food be taken into the stomach of a quality and in quantity suitable to the vital energies of the system, it is changed into a healthy chyle, suited to the repair of the frame. If, however, the appetite be excited, so as to digest more than is necessary for the wants of the body, and if inadequate means be resorted to, to procure the secretion and excretion of what is superabundant or noxious, a plethoric state of the vascular system must be the consequence; and this state will be productive of active disease in some important viscus, and, in warm climates particularly, in those viscera which are more especially influenced by the very efficient sources of disease already investigated.

Whether or no the quantity of food generally taken by European residents in warm climates be too great, and whether or no the beverages usually resorted to, are such as the wants of the system demand, and no more, we now proceed to inquire. We shall afterwards shew how any excess of food or drink beyond what is necessarily called for, becomes productive of that particular condition of the vascular system in which the majority of inter-tropical diseases originate, and without the previous existence of which the more immediate causes of these diseases,—viz. those which proceed from the soil,—would be less frequently productive of their usual effects upon the European constitution.

In order to convey a correct idea of the mode of living in India, we shall detail the usual routine of a single day, observed by the European orders of society. The military officer goes to parade at six o'clock A.M., and breakfasts between eight and nine upon tea, coffee, or cocoa, with fish, meat, eggs, rice, and whatever may be most agreeable to him. From breakfast till one o'clock he generally applies to study or amusement, or to paying visits. The heat of the weather, and perhaps a hearty breakfast, and the nature of the articles taken at it, produce thirst, which renders the necessity of gratifying it urgent, and occasional draughts of wine and water, beer and water, or brandy and water, are therefore necessarily taken; and although this is by no means a habit, nor is indulged in beyond what seems a matter of necessity, yet it must, in a certain degree, be injurious. At one o'clock he eats a hearty tiffin, consisting of roast and boiled meat, fish, mullagatawny or other soups, various wines, bottled beer, &c. He afterwards occasionally rides out in the sun, and either lounges on a sofa, or amuses himself with cricket or fives till evening parade. Dinner is next disposed of, at seven o'clock, or half-past seven, or eight. This meal is, properly speaking, the supper, that which is taken at one o'clock being the dinner. The seven o'clock meal is generally profuse, consisting of soups, fish, rich and hot curries, roast and boiled meats, and other richly made dishes, with various wines, and bottled beer. To all this succeeds coffee or tea; and upon the repleted stomach and excited system he retires to bed at eleven or twelve, when the feverish collapse induces the sound sleep indicating plethora, or the restless slumbers attendant upon prolonged excitement.

The same system, which is pursued daily by the military man, and which is varied, of course, according to the habits and disposition of the individual, is followed, with but little variation, by the civilian. The latter rides, in the cool of the morning, from his country-house to his office, where he generally has tiffin at the usual hour, and rides home again in the cool of the evening to dinner, which is usually upon the large scale already noticed.

Thus it will be seen that animal food is partaken of very generally at three meals daily, and always at two of them; and when we consider that this species of food contributes most powerfully to the production of a plethoric state of the vascular system, the foundation which is thereby laid for disease is most sure, and, when inquired after, most apparent. In order to trace more clearly the bad effects of over-feeding the body, we shall inquire into the nature and tendency of the various articles of food and drink usually adopted by the European resident in India and warm climates.

The hot and highly spiced soups which are usually taken in warm climates, both to tiffin and dinner, are hurtful to the functions of the stomach and liver. They serve to distend the former viscus, to induce an excited state of its mucous surface, and to increase the quantity of the fluids absorbed and carried into the vascular system. Owing to the intimate nervous connexion existing between the digestive canal and the liver, they also tend to stimulate the latter viscus, and to induce, by the frequent and daily repetition of the stimulus, an inflammatory state of its vessels. Soups, moreover, of this description are themselves difficult of digestion, particularly by weak individuals, owing to the circumstance of their over-diluting the gastric fluids; and they not unfrequently impede, from the same cause, the digestion of other substances taken about the same time.* The same observations equally apply to highly spiced curries and sauces; these also tend to irritate or excite the stomach and liver, and to stimulate the palate and appetite, so as to lead the individual to partake of more than the functions of the digestive organs can dispose of in a healthy manner. To all these excitements are usually added, at three meals each day, variously prepared dishes and beverages,—so that when the appetite is

* See the chapter on Digestion, at pp. 19 and 20.

cloyed by one, it may still relish some other ; and hence a much greater quantity of food is usually taken than can be well digested, or, if digested, than the wants of the system require. To the allurements which variety presents, are added, at no less than two meals daily, those which various wines and beverages offer. These latter are indulged in, and they impart their aid to the various spiced dishes, sauces, and curries, in stimulating the stomach to receive more into it than it can properly dispose of, and in exciting and promoting an inflammatory action of the vessels of the liver and mucous surface of the digestive canal. Thus it will be perceived, that the articles of diet, and the great variety of them, together with the wines which are used in warm climates, more especially in the East, have a direct tendency to excite the stomach and liver, and to induce inflammatory action in these viscera particularly ; that, at the moment of their being taken, the appetite is roused by them beyond its natural and healthy pitch ; that hence they are usually taken in great excess, or much beyond what is requisite to the wants of the system ; and that, as soon as the artificially roused excitement of the digestive function subsides, the organs employed in the operation are inadequate to dispose, in a healthy manner, of all which has been taken, and on which they have to act ; and hence an imperfectly digested chyle is formed, which vitiates the whole circulating mass, excites the system, and assists in the generation of disease. A large portion also of the imperfectly digested food becomes acid, acrid, or otherwise hurtful, and either irritates or inflames the mucous coat of the intestines, whilst it passes off with the egesta, or is partly absorbed and carried into the blood, where it becomes the cause of disorder in those organs to which it is more immediately conveyed.

The bottled ale and beer which are taken in the East Indies and other warm climates are also particularly hurtful to the European constitution, and contribute largely towards promoting the ill effects of those articles of diet now mentioned.* Having thus stated what appears to us most injurious in the

* We do not mean to say that bottled ale or beer are in themselves unwholesome, but that they dispose to plethora, and are injurious to the functions of the stomach and liver when taken too largely, or about the same time with soups and various wines. The admixture of the different beverages and articles of diet is very often the chief cause of disorder.

diet usually adopted, we next proceed to take a more intimate view of each particular meal, and to suggest certain improvements, which, if not followed by those who take sufficient exercise, and who may therefore require a more liberal allowance, is indispensably requisite to the weak, the invalid, the indolent, or whoever are incapable of those robust exercises or active avocations, which, while they do not absolutely require great indulgences on the parts of those who are engaged in them, yet render indulgence less hurtful to the system.

The breakfast ought to have some relation to the period which has elapsed from leaving the place of the night's repose to that at which the meal is made, and to the appetite at the time. If there be little or no appetite, it ought not to be spurred by relishing articles, or by animal food highly seasoned. This sort of breakfast ought only to be indulged in by those who have good appetites, a healthy constitution, and who have enjoyed both air and exercise before they partake of it. The weak, the delicate, the indolent, or those who breakfast soon after rising from their beds, or who, owing to various causes, have little or no appetite, should not attempt to excite it artificially, but should content themselves with the simpler breakfast, consisting of tea, or coffee, or cocoa, or chocolate, with bread or rice merely, or with a single egg very softly boiled. The bad effects of animal food, or salted or spiced articles of diet, at breakfast generally become apparent in the thirst and heated state of the system during the morning and the subsequent warm part of the day. Those who breakfast as early as eight or nine in the morning, require some tiffin or a light dinner about one or two. But this meal, instead of consisting of spiced soups and curries, much animal food, and bottled ale or beer, should consist of little or no animal food, or, if of any, it should be of the less exciting kind, as that of white-fleshed animals. Soups highly spiced ought not to be taken at this time of the day, but some of the farinaceous articles of food should be preferred. If wines be at all resorted to, a glass or two of claret, or of the Rhenish wines, is preferable; and, instead of bottled ale or beer, pure water is the best substitute. At the particular period of the day when the tiffin is usually taken, the temperature of the air is nearly at its highest, the body is heated, and the languid state of the system generally, and of the digestive

organs more particularly, can but ill dispose of much food, especially if it be of an irritating quality, or at all difficult of digestion. The appetite is generally the best guide to the quantity and kind of food to be taken. When the palate cannot relish plain and simple articles of diet, then food is in no measure necessary; and every means which may be resorted to, in order to goad the languid appetite, proves only injurious to the system, whether such means consist of highly seasoned dishes or finely flavoured wines.

The dinner is generally with Europeans, in warm climates, much too heavy a meal. It should, however, be the principal one, — that taken in the middle of the day being the lightest of the three. The evening is favourable for a full meal in warm countries, the system being refreshed by the coolness of the air, whilst it is fortified by a supply of food at the time when it is liable to the invasion of those causes of disease which issue from the soil, and which are generally most concentrated and most hurtful after nightfall. Soups, more particularly such as are highly spiced, should be avoided also at dinner by those who are weak or subject to hepatic complaints, or who complain of indigestion, for the reasons already assigned; and if they be at all resorted to, they should be used in small quantity, and be as simple as possible. Those who have a tendency to liver ailments, or who suffer from them, ought carefully to avoid much animal food, the use of all spiced dishes, and all allurements to indulgence, either in eating or in drinking; for it appears to us, from *à priori* reasoning, as well as from an extensive experience, that as much disease of the digestive organs, and of the liver especially, is occasioned by excessive eating, by partaking of many highly seasoned dishes, the one whetting the appetite for the other, until a very great deal too much is taken—as by excessive drinking. Indeed, the latter, although indulged in by many farther than we may think beneficial or prudent, is now seldom to be imputed to the Indo-European. But eating more than is necessary for the repair of the waste of the system is much more generally the case, and the practice is persevered in, from an opinion but too generally entertained, that the use of animal food and full living is requisite to keep up the energies of the system in intertropical countries.

In warm climates, the thin and weak Rhenish or French wines should be preferred to the stronger wines of Spain, Portugal, and Madeira, which ought never to be used, even in a state of dilution. Wine and water, and brandy and water, are prejudicial to the system, for the reasons assigned when treating of the digestive functions;* and when taken between breakfast and tiffin, or even along with the latter meal, they dispose to indolence, occasion drowsiness, and although their use is followed by a cooling and quenching effect for a few minutes after they are taken, they never fail to feed the flame they are intended to put out, and to perpetuate the thirst they are expected to quench. Even the lighter wines of France ought to be taken with much moderation, and should never be indulged in at tiffin beyond two glasses. Indeed, whoever entirely foregoes the use of wine at this meal, and contents himself with pure water, will find himself more disposed to the pursuit of business, study, amusement, or whatever he may choose to employ himself with until the hour of dinner. After this meal he may then indulge, but with great moderation, in a few glasses of this agreeable, and in some respects necessary, beverage; but during the course of the meal, as well as subsequent to it, the admixture of stronger wines, and still more especially malt liquors, ought to be altogether avoided. The man who lives temperately, as respects both eating and drinking,—who never attempts to excite the palate by relishing articles, highly spiced dishes and sauces, exquisite flavours, or delicious wines,—who eats merely a sufficient quantity of very plainly cooked food, of a digestible quality, to support the energies of the system and repair its waste,—who drinks only when thirst absolutely requires to be quenched, and resorts to that which is most permanently quenching and cooling,—will be found the most energetic in all his undertakings, whether mental or corporeal; and although he cannot always avoid exposure to the causes of disease, yet he will be less obnoxious to their invasion, and when affected by them, he will experience them in a less severe manner, and run less risk of their fatal termination.

The living of the European soldier in India in many respects resembles

* See pp. 19 and 20.

that of the better classes of European society, excepting that his breakfast is less substantial, his beverages more spirituous, and his dishes less numerous. The hurtful parts of the diet of Europeans are, however, attainable, and usually adopted by him. He is often exposed to the raw morning air, loaded with the exhalations from the soil, before the sun has rarefied them and rendered them comparatively innocuous, with a scanty or with almost no breakfast, and, upon a nearly empty stomach, receives his allowance of two large glasses of undiluted arrack. The hurtful effects of this upon the system, more particularly upon the stomach and liver, must be apparent to every reflecting mind. Officers will consult their own interests, as well as their better feelings, as we know them frequently to do, by attending to this particular diet of the soldier; and by doing so, they will be the means of preserving those under their command both healthy and efficient, and thus acquire their respect and attachment. It would be better for the soldier, in warm climates, were he to have his breakfast as soon after he rises as possible, and that this meal should be, as respects both kind and quality, sufficient till the middle or afternoon of the day. He would then bear exposure to the chief causes of disease, which are generally concentrated and energetic early in the morning, without risk, and be better able to endure the exercise and duties of the day. The hotly-spiced soups and curries which are usually prepared for the dinner of the soldier are generally prejudicial, and relished by him only after he has become accustomed to them. A simpler mode of dressing his meat diet ought therefore to be generally enforced, and his allowance of spirits should be served out to him in a diluted state in the evening, so as to be taken after his dinner, or about night-fall, when the system is liable to be invaded by endemic causes of disease, which then generally accumulate with the falling dews and fogs, and with the stillness of the air, which frequently prevails at this time of the evening. We shall not at present enlarge farther on this subject, as we shall have occasion, towards the concluding part of the work, to offer some remarks upon the economy and management of European troops in India.

The diet of the natives varies very considerably. The Mahometan eats meat daily, when he can procure it. The Pariah and some of the other castes adopt

a similar indulgence, to an extent which varies with circumstances; and but few of the Hindoos altogether abstain from animal food of some kind or other. Even with many of the stricter castes, the flesh of the wild deer, the antelope, and of fowls and game of all kinds, are not forbidden: and fish, both fresh and dried, is partaken of by all. But, upon the whole, animal food is sparingly used amongst the natives, with the exception of the Mahomedan and the Pariahs, who partake of animal food when they can procure it, but generally to a much less extent than Europeans. Those of the natives, however, who partly live on animal diet, are stronger and more able to bear up against acute diseases than those who live more exclusively on vegetable food. The diseases of the former somewhat more nearly approach to the type and character of the disorders of Europeans; whilst those of the latter are much less inflammatory, and generally much more fatal, the powers of life sooner sinking under them when they assume an acute form.

This circumstance, which is important in various bearings, has been unjustly viewed as distinctly shewing the necessity of recommending the European to adopt a full and liberal diet of animal food. But the indication which may legitimately be derived from it has been carried much too far, and the difference in the original conformation and temperament of Europeans and Hindoos has not been taken into account. The European also, it should be recollected, is fully formed, and his physical and intellectual powers developed, ere he embarks for India; hence food is required only for the repair and support of the system. The use of animal food once in the day, and that in moderate quantity, is all that is requisite to the support of bodily vigour; and whatever is taken beyond this, or even beyond a very moderate quantity at a single meal daily, generates plethora, occasions congestions of the venous system, and induces an oppressed and cachectic state of the body, soon producing acute disease, which speedily exhausts itself, and terminates in fatal collapse.

Having now shewn that the diet of Europeans in warm climates generally, and in India in particular, is much too rich, stimulating, and heating, and productive of plethora of the vascular system, and consequently of fever,

whenever the exciting causes of fever are in sufficient force to affect the system; and having expressed our conviction that it is calculated, in a most marked manner, to disorder the functions of the digestive organs, particularly those of the liver, and to lead to organic disease; having also pointed out a more judicious and beneficial system of diet,—we shall next proceed to offer some remarks upon exercise, as necessary to health in warm countries; and afterwards conclude with some observations on the consequences to which full diet and want of exercise necessarily lead in warm, and indeed in all climates.

Exercise in the open air is one of the most sure means of promoting the health in warm as well as in temperate and cold countries. Europeans residing in the former generally experience a listlessness and indisposition to bodily exertion of every kind, that completely precludes all ideas of any effort, unless when circumstances compel them; and hence those who, either from their position in society, the nature of their avocations, or from an uncontrollable indolence, resort not to this means of preserving health, soon become the prey of disease. Exercise in warm climates, even when taken in the coolest time of the morning and evening, necessarily produces copious perspiration, which is not generally pleasant to the sensations of those who have spent the early part of their lives in cold countries. But it is the very copiousness of perspiration which renders exercise salutary, if care be taken not to chill the body subsequently.* The full meals of animal food, and the usual course of diet and regimen adopted by European residents in warm countries, tend so invariably to create a plethoric

* Much mischief frequently arises from the habit too generally adopted by all classes of Europeans of throwing off the coat, neckcloth, or stock, and thus lounging on a couch or sofa, exposed to currents of air, upon returning home overheated and perspiring from riding or walking. The use of the punkah, or large fan, for the purpose of cooling the body when perspiring from exercise and deprived of the outer habiliments, is equally hurtful. When exposed, under such circumstances, to currents of cool air, the evaporation from the body is accelerated, coldness of its surface rapidly produced, and the circulation suddenly thrown back upon a weakened, predisposed, and sometimes an already diseased organ. The imprudence now noticed, for the purpose of remedying it, is a most frequent cause of sickness amongst young European recruits on their arrival in India.

condition of the vascular system, and a state of congestion of the liver and spleen especially, that if the former be not diminished by the copious perspirations occasioned by active and frequent exertion, and the latter removed by the accelerated circulation, as well as by the increased determination of the fluids to the surface of the body, produced by the same means, acute or chronic diseases, such as fevers, hepatitis, dysentery, &c. must, sooner or later, supervene upon exposure to their exciting causes. The usual consequence of overfeeding, in all animals, as well as in man, combined with indolence and want of exertion, is enlargement of the great glandular organs of the abdomen, particularly the liver; and this consequence is the more marked, and the sooner induced, the warmer the temperature in which the animal exists, and the more complete the inaction to which he is doomed.

But a regular and sufficient exercise,—so as to promote a full and copious perspiration and regular circulation in the cutaneous surface,—is not only serviceable in overcoming plethora, and unloading the vascular system of a part of those fluids which are continually being conveyed into it through the medium of the absorbing vessels, and in removing the congestions and determinations of the circulating mass upon the large abdominal viscera; but it most unequivocally and powerfully promotes the healthy functions of those organs which are engaged in the elaboration of the most important secretions of the body, and in the elimination of those materials from the blood which have served their purposes in the economy, and whose removal from it is requisite to its healthy condition. The secretion of bile, the removal of congestions of this fluid, which we have shewn frequently to take place in the biliary ducts of the liver, as well as in the gall-bladder,* the secretion and discharge of urine, and the cutaneous secretions, are all promoted by a regular and sufficient exercise.

But in order that exercise may be beneficial, it must be regular, and continued without intermissions of indolence—it must be daily, and in warm climates it should be taken in the cool of the morning and evening; thus

* See pages 27 and 28.

leaving the intermediate hot part of the day to reading, study, conversation, or whatever occupations may not over-fatigue or over-excite the system. We do not mean, however, to inculcate that no exercise should be taken in the middle of the day, or that lighter occupations and amusements may not then be entered upon ; but that these should be pursued much more rarely, and with greater precautions as to temperature and exposure to the sun, than in the early and latter parts of the day. Other precautions as to exercise are also necessary, even when resorted to at periods apparently the best suited to the purpose. It should not be too violent in its nature or tendency, so as to fatigue and exhaust the system ; but it ought to be sufficient for the purposes already indicated, and should, in a warm climate, be followed by a genial and copious perspiration, which ought not to be checked by exposure to cold or currents of air, or by a sudden discontinuance of the exercise which occasioned it. During the period of taking exercise, those causes and places which we have shewn to be productive of terrestrial exhalations should be avoided ; but if the exercise be properly suited to the season and time of the day in which it is taken, they need not in any measure be dreaded.

With respect to the kind of exercise that is to be preferred, this must depend upon circumstances. Riding in carriages can scarcely be considered as sufficient for the wants of the system, unless in the cases of weak, sickly, or convalescent persons. Horseback and walking exercise are preferable, and both should be resorted to. Cricket and fives are useful and amusing means of exercise in the cooler periods of the day, and billiards answer the purpose well when the temperature precludes any more active means. Above all, indolence should be avoided, whether of mind or body ; it enervates the whole frame, becomes more inveterate from indulgence, and exposes the system to the invasion of all the causes of intertropical diseases. An inactive mode of life also leads the mind to indulgences which are hurtful to its own energies, as well as baneful to the physical condition of the body. When the mind is unemployed or unexcited by those avocations and undertakings, which, while they interest the mind itself, impart energy to the frame, the follies and dissipations of life are more freely indulged in, the causes of disease more readily impress the system, both from without and from within, and hence the

indolent and inactive become soonest the prey of disease, and are its most ready and numerous victims. That person will enjoy his health the best of any, in warm climates, who occupies his mind with interesting and important pursuits,—who takes a regular, a judicious, and a sufficient exercise,—who lives in moderation and without undue indulgences, and adopts in every respect what we have recommended in a former section of this work.*

Before we altogether leave this particular part of our subject, we shall further inquire into the usual effects of repletion, particularly in its relation to inactivity and a too sedentary mode of life.

Of all the various animal wants and indulgences, eating and drinking are those most liable to irregularity, from their being so much under the control of the will, from the gratification they afford to the senses, and from the frequent return of the desire, as well as the necessity of complying with the intimation they convey at comparatively but short intervals. The wise provision, however, manifested in our organization, and the wide range permitted to man in the choice of his food, are such as both to allow of great diversity in his selection, and to diminish the danger of an injudicious adoption. Yet the wise limits imposed by nature cannot be frequently passed without danger. Such imprudence frequently, indeed, punishes itself. But the repetition of excesses, or the adoption of a too great quantity, variety, or improper quality, of food and drink, is always productive of effects most injurious to the functions, and even to the organization, of those organs whose office it is to dispose of the ingesta, and to change them into healthy materials for the repair and support of the frame. If we look closely into the commencement and early progress of many of the disorders of warm climates, we shall have no difficulty in tracing how errors committed in this way influence the functions of the abdominal viscera, and derange the whole system. While occasional excesses, or deviations from the strict rules of temperance, are productive of increased action, which soon subsides if the cause be not renewed,—and while several of the consequences of such excesses remedy themselves without the assistance of

* See pages 100 and 101.

art, when the functions and organization of the internal viscera are sound or not materially impaired,—yet the frequent repetition of such excitements exhausts the energies of the constitution, until they are no longer able to preserve it from suffering from the slighter causes of disease, which, in their unimpaired condition, they would have successfully withstood.

In cases where the excitements to increased action are applied either directly or near to the organ liable to become the seat of such disorder, or to one with which the predisposed organ has an intimate connexion or functional relation, the powers of the constitution, however considerable, are then inadequate to preserve it from disease. As long, however, as the energies of the body are not materially impaired, the usual immediate consequence of repeated and almost continued excitement is, to produce and to perpetuate an inflammatory condition of the vessels of the viscus to which these causes are so applied, attended with an increase of function; and this state is extended to the adjoining parts: this is generally the case with respect to the digestive organs. The European, for the first few years of his residence in a warm climate, whilst the powers of his system are but little impaired, indulges but too frequently in a too great variety and in a too great abundance of animal food, highly spiced and rich dishes, and heating wines. This stimulus is applied to the stomach at intervals of only a very few hours; and hence the excitement is kept up, the function of the organ increased, and an inflammatory state of its vessels and adjoining viscera induced. The increase of the digestive functions generates plethora, and the fulness of the vascular system either gives rise to fever, when the exciting causes of fever are in sufficient force to produce it, or at last some organ experiences the onus of disease, owing to the supervention of causes disposing it to be so affected. In cases where much animal food and a variety of highly spiced soups, sauces, and dishes, are daily devoured, the liver soon becomes disposed to disorder. For the first effect of this plan of living is to occasion increase of function of the stomach and of all the viscera related to it; the second is, to induce a plethoric state of the vascular system, and to produce a greater determination of blood to all the abdominal viscera, for the purpose of enabling them to discharge the increased offices required of them, and to dispose of the materials

on which they are to operate. Hence, a greater quantity of blood being sent to the stomach, bowels, and collatitious viscera, a larger quantity will also circulate in the vessels of the liver, particularly in the vena portæ; and the loaded state of this important part of the vascular system will most materially dispose the liver to disease, and at the same time occasion derangements of the organs in the vicinity, according to peculiarity of constitution or of predisposition.

As long, however, as the exercise taken by persons exposing themselves to the afore-mentioned causes of disease is sufficient to promote the evacuation of the excess of those materials received into the stomach above what is necessary to the wants of the system, and to increase all the secretions and excretions of the body, as well as to remove internal congestions, and determine the chief flow of the circulating fluid to the surface of the body,—little mischief will be occasioned, unless the indulgence be considerable, and actually amount to excess. But as soon as indolence or sedentary habits are indulged in, then disease, or its forerunners, supervene, more especially if those individuals who subject themselves to those very influential causes of disease, viz. over-feeding and indolence, are exposed to the prejudicial influence of malaria in its various forms and conditions, as we have shewn it to exist in warm climates.

The influence of diet and regimen upon the health of Europeans in warm climates is very forcibly shewn in the varying characters or kinds of disease to which they are subject, according as the modes of living differ. European soldiers live much less fully, as respects eating, than their superiors; but they drink more spirituous liquors, and indulge in the intoxicating drinks of the country. They are also exposed more to the climate and its vicissitudes, and to the exhalations proceeding from the soil. The results of all these upon their constitutions are, a greater liability to fevers, dysentery, and the more acute form of hepatitis. On the other hand, the better classes of society, who indulge more in the gratifications of the table, who drink more wholesome beverages and in much greater moderation, and who are less exposed to the vicissitudes of the climate and to marsh exhalations, are less subject to fevers and

dysentery, but more liable to stomach complaints, and to the functional and chronic disorders of the liver.

The observations which we have now offered respecting the manner of living in warm climates generally, are, in a great measure, applicable to society in several countries in Europe; and we are convinced that a great proportion of the diseases which are met with in the middling and better classes of persons in these countries, derive their origin from the full living and the heating and nutritious dishes indulged in. In warm climates, however, the hurtful effects of this sort of diet are heightened by the greater elevation of temperature, by the abundance of terrestrial exhalations floating in the atmosphere, and by the circumstance, that Europeans residing in warm countries seldom enjoy exercise to the extent to which they require it, and by the general indisposition on their parts to take it, even when they have it in their power. The succession, also, of seasons, varying so much as respects temperature in cold and temperate countries, while it tends to produce in these quarters various diseases, not materially prevalent in India or in warm climates, has a considerable influence in diminishing the evils resulting from full living, and in invigorating the system generally. Within the tropics, the bracing effects of a cool, dry air are seldom felt; and the continued operation of a high temperature and a moist air loaded with miasmata, most materially impairs the powers of life, diminishes and otherwise deranges the secreting viscera, and renders over-feeding, and all other kinds of intemperance, productive of plethora, and the diseases resulting therefrom, as well as those maladies which spring directly from a morbid state of the secretions concerned in the functions of digestion and chylication.

CHAPTER III.

OBSERVATIONS ON THE EARLY OR PREMONITORY SYMPTOMS OF INTERTROPICAL DISEASES, AND ON THE IMPORTANCE OF EARLY ATTENTION BEING PAID TO THEM BY THE MEDICAL PRACTITIONER.

It will be admitted by all practitioners, that disease is generally far advanced before application is made for relief. In civil life this is a circumstance which the physician cannot control, however he may regret it; but it is somewhat different with the regimental surgeon. He is constantly with his men; and if his attention be directed to the well-being of those under his charge, he may often observe, even in the change of countenance, the approach of disease. By carefully and watchfully discharging his duty, in warm climates more particularly, and by detecting the accession of disorder, he acquires a great advantage over the practitioner in civil life,—an advantage which he may turn to account, either in checking disease at its outset, by the treatment which he may then adopt, or in diminishing its severity and danger through its advanced stages, when it cannot be arrested. That these advantages are attainable by those who are anxious for the health and efficiency of the individuals committed to their charge, was very forcibly impressed upon us during the expedition to Java, when in charge of His Majesty's 78th regiment. On all occasions of actual service within the tropics, the efficiency of every man is of the utmost importance; and with that feeling, our attention was particularly drawn to the men under our charge, not only to give assistance when called upon, but to endeavour to prevent disease. In order to gain this desirable end, we made it a point, during the passage to Java, from April to August 1811, at the daily parade of each company, and often when the men were off duty, to examine the expression of their countenances; and whenever

we observed any sign that marked the slightest degree of disorder, we immediately instituted farther inquiry, and resorted to means suited to the information obtained. The good effects of this attention were manifested on the disembarkment of the troops at Java. Not more than seven were left sick out of about 500 men in the head-quarter ship, and which were under our more immediate charge; and not more than thirty or forty out of the whole regiment of 1070 men: thus, in our judgment, proving that the diseases of warm climates may be often prevented, or checked, or mitigated, by early measures of a decided and judicious nature. We have since never overlooked similar opportunities of paying attention to the approach of disorder, and to the early symptoms by which it is indicated; and the results have been similar on all occasions.

The premonitory symptoms of disease are frequently so very slight as to pass unnoticed by the patient himself, and are often considered of no moment by the physician. This we conceive partly to arise from the indifference with which many treat what is called slight bilious feelings, and from the expectation, that the uneasy sensations which are felt arise from a temporary disturbance of the functions of some one of the digestive organs, which will soon bring about its own cure, without the trouble of application for medical advice, or the disagreeable necessity of resorting to medicine. But the subject is too important to be so lightly viewed, and is, moreover, of so great moment to the public services of the country, that the attention of both the physician and the community should be properly directed to it as a means of preventing and checking disease, and thus of preserving soldiers and sailors in warm climates more competent to the discharge of their duties.

It is evident to every one who has observed the early progress of disease, that, before those sensations and symptoms are experienced which are more generally regarded as denoting its actual existence, a period elapses during which disorder is forming and advancing to that pitch which at last convinces the patient himself, and the medical man to whom he then applies, that disease has assumed a specific and an important character. In the very numerous instances of fever which are hourly occurring to the intertropical

practitioner, patients seldom or ever apply to him, nor does he scarcely ever meet with a case of the disease, before the stage of rigor is fully formed, and most frequently not until the stage of reaction or excitement is developed. And yet, every medical man who has looked closely into the phenomena which disease presents, from the first impression of its exciting causes, until it fully explodes itself upon the frame, knows that days of disorder exist, marked by symptoms, which, however perceptible and perfectly cognizable to the experienced and closely observing physician, are yet treated as immaterial by the patient himself, or at least looked upon as that sort of slight stomach or biliary disorder which quietude and moderate diet will remove, without further assistance.

In fuller illustration of this subject, we shall instance a very frequent case, and one that will be recognised, not only by those in India, but by those who have ever been there;—we allude to snipe shooting and hunting parties. These are generally arranged late in the evening, after dinner, and are entered upon early in the morning. It is impossible, therefore, that the individuals engaged in them can have the repose necessary to recruit the system from the exertions of the preceding day. After riding eight or ten miles, they commence snipe shooting in the marshes and rice-fields, where they are up to their knees in water; and thus, in a state of fatigue, they are at once brought within the influence of those marshy exhalations which are the most frequent exciting cause of fever in warm climates. The exposure to this cause taking place during a period of predisposition to its invasion, and at a time of the day when the cause itself is in considerable concentration, that impression is made upon the system which is productive of fever, and its future subject returns from his excursion with the seeds of it sown in his frame. For a day or two he complains of little or nothing excepting a weight in his back, loins, and limbs, some loss of appetite, and a disinclination to exercise or employment of any kind. To these he attaches no importance, imputes them to fatigue from his excursion, and he does not resort to any means for removing them. They, however, continue, and even increase; and in a short time a slight headach, with confusion of ideas, comes on, especially towards evening, and is attended with disturbed repose and unpleasant dreams. His appetite now becomes further

diminished, his countenance is pale, sallow, and a somewhat darker tinge is remarked beneath his eyes, which are at the same time muddy, and deficient of their usual expression and liveliness. These symptoms continue for several days: they are insufficient to confine him, or even to excite ideas of his being actually ill; but he feels out of health, and every kind of occupation is a burden to him. At last, after a period widely varying in its duration, generally enduring from two or three days to a fortnight,—during which time these symptoms continue gradually to increase,—nausea often supervenes, the bowels become irregular, the tongue white and loaded, the countenance sunk and muddy, the surface cold, dry, and harsh; and at last, irregular chills, formication, and even complete rigors, supervene, with sinking and a sense of anxiety at the pit of the stomach and præcordia, and increase of the pain in the head, loins, and limbs. This is that precise stage of the disease at which the patient generally becomes alarmed, and when he is first unable to keep about. The medical man now sees him for the first time, or more frequently not until disease has burst its way throughout the frame, and excitement is fully established. It is then too late for him to arrest the disease, yet still much may be done to mitigate its violence. But being fully aware of the time and nature of the exposure to the cause of the disease, with the exact character of those symptoms which denote its first formation, the physician would have it in his power to employ those means which, in the majority of cases, would almost immediately arrest that train of morbid phenomena going forward in the system, and restore the subject of them to perfect health. What these means are, it is not our present purpose to shew, as we shall have to state them fully and explicitly, when fevers come before us, in the second volume of the work. Patients themselves, in warm countries, especially those in the better ranks of life, being made acquainted with those sensations and signs which indicate the commencement and early progress of disease, and being informed of the effects which more immediately, although less perceptibly, proceed from its exciting causes, will be induced to make a more early application for medical aid; and when such aid is not within their immediate reach, will be enabled to resort to such simple and safe means as are in the power of nearly all, but which ought, however, only to be resorted to until more experienced and efficient assistance can be

procured. The necessity, in short, of paying an immediate and efficient attention to the premonitory symptoms of disease, ought to be impressed upon the mind of the young and inexperienced medical officer, and, whenever it can be done with propriety, upon the minds of persons generally who are resident in warm climates, because disease runs its course in these climates so rapidly, that the loss of an hour is of importance.

Before we leave this particular part of our subject, we shall offer a few general remarks upon various states of the system which usually precede the full development of specific disease; but shall defer, until the diseases embraced by this work are treated of, the consideration of those signs which generally precede, and, as it were, advertise the supervention of these diseases individually, as belonging more appropriately to these particular heads. The advantages to be expected from thus becoming familiar with the first morbid signs resulting from the impression of the exciting causes of disease, are apparent, and need not be further remarked upon at present.

Besides those diseases which proceed more directly from external impressions, there are others which result from internal sources. The former are, upon the whole, the more frequent in warm climates; but they do not always depend upon external causes alone, the internal changes taking place in the system, in consequence of ill-regulated diet and regimen, being the predisposing causes favouring their operation. What the chief of those errors of diet and regimen are, which prove the fruitful source of many diseases, and the predisposing causes of many more, we have already shewn; but there still remains various points connected with the subject requiring to be touched upon, and which, in a stricter sense, should be viewed as the first changes constituting disease, rather than its causes, although, like all other derangements to which the living frame is liable, all functional or even organic changes become causes of subsequent disease.

We have already mentioned the consequences of full living, particularly on animal food, conjoined with indolence; and we have shewn that plethora is a necessary consequence of the indulgence. But we have still to remark upon various circumstances arising out of this state, or at least accompanying it.

Full living on animal food is frequently attended, in many temperaments, with a constipated or otherwise irregular state of the bowels, and a costive and offensive state of the stools; and this is more remarkable in those who take little or no exercise, and even in those who enjoy sea air, or change of air, without much personal exertion. The consequences of full diet, combined with deficient exercise, and a constipated state of the bowels, must be apparent to every one who reflects upon the laws of the animal economy. Although in many instances this state of existence can scarcely be viewed as constituting disorder, yet in others it is evidently so, and in every case it must at least be viewed as leading to it. Constipated states of the bowels, in persons living much upon animal food and rich dishes, tend very rapidly to produce not only plethora of the vascular system, but also to vitiate the constitution of the blood itself; for constipation is very generally an effect of an inadequate state of function of the great secreting viscera, and of the mucous surface of the digestive canal. Indeed, the biliary and other secretions which are poured into the intestines are actually formed, in a great part, from the materials which require to be removed from the circulation, and upon whose removal the purity of the blood in a great measure depends; and while the due and abundant formation of these secretions thus tends to the purification of the circulating mass, and to the diminution of its quantity, the requisite regularity of the excretory functions is thereby promoted.

But it is not only a constipated state of the bowels which is to be observed as characterising the commencement of disease, and hastening its progress,—a too relaxed or otherwise disordered condition are likewise present on several occasions. The bowels may be remarkably costive, and afterwards relaxed; and, attending the relaxed state, much tenesmus and scalding, both during the time of passing a motion and afterwards, may be present. When such is the case, active purgation is then indicated, as the best means of preventing further disorder; and this indication is the more urgent if the stools are obviously deficient of bile, or if they afford proofs of an unhealthy condition of this fluid, and of the intestinal secretions generally. These are circumstances which will be fully insisted upon in the sequel; but the attention of both patient and practitioner ought to be drawn to them as important premonitory signs of disease. It should also be remarked, that, although

the stools appear natural and healthy in colour, the alvine secretions and functions are not on that account to be considered as free from disorder; especially if there be present any symptoms indicating the contrary: for it will be often observed, that after the repeated exhibition of purges, the stools, which were at first healthy, change their character, and at last indicate that the morbid secretions and accumulations are at last let loose, and are in process of being brought away: even the exhibition of a single brisk cathartic will often shew, in cases where it has been much wanted, the first and second stools natural, and the third, fourth, fifth, and sixth, more and more disordered and offensive; and this sequence of appearances will often continue to present itself for several successive days, when purgation is daily prescribed, until the alvine evacuations, on the removal of all disorder of the abdominal organs, at last will acquire a healthy appearance. There are extremely few diseases in which the functions of the bowels are not more or less deranged at their commencement, and in which, even when the stools are regularly voided, they are not slimy, viscid, tenacious, dark coloured, and variously offensive. And it should be always kept in recollection, that the functions of the chylopoietic viscera and intestines are not necessarily regular because the bowels are daily evacuated. The motions themselves ought to be examined, and opinions drawn from the appearances they exhibit.

Indeed, we consider, as corollaries from the foregoing, and as pathological facts of the utmost moment in the investigation of the early conditions and changes in the system leading to, or constituting disease, that much animal food, the use of malt liquors, and insufficient exercise, are most eminently productive of plethora;—that plethora, if its causes be persisted in, will occasionally remove itself, but not without being productive of actions constituting disease, such as diarrhœa, dysentery, or fever;—that, when constipation is superadded to full living and insufficient exercise, then it may be also inferred, that the resulting state of plethora will be further increased by the diminished functions of secretion and excretion, constituting costiveness;—and that, as secretion and excretion are in a great measure the discharge of hurtful or superabundant materials from the blood, this fluid will be, under such circumstances, deranged in quality, at the same time that its quantity is much too great. Even when the functions of secretion are going forwards in the

abdominal viscera, if excretion be not at the same time regularly and adequately, as respects the quantity of ingesta, performed, a great part of the secretions will be reconveyed into the circulation, with a portion of excrementitious and hurtful matter, where the whole will be a source of further disorder, until the functions of some emunctory at last remove them.

This condition of the vascular system, and of the secreting and intestinal functions, is often combined with a foul and diseased state of the cutaneous surface; and, in our estimation, there is nothing which more completely proves the co-existence of full and gross feeding, with many of its consequences — namely, plethora, diminished or morbid secretion, and a constipated or an irregular state of the alvine evacuations — than the presence of some one of the numerous family of cutaneous eruptions. The co-existence of external eruption with plethora and imperfect secretion and excretion, is often indeed a fortunate circumstance for the patient, inasmuch as the external disorder may, with the greatest propriety, be looked upon as one of the chief means of preventing the particular state of the vascular and secreting organs now insisted upon, from being productive of disease in some internal and vital organ. How often, indeed, do we find, that those who take narrow views of the origin of external diseases, and by local means endeavour to shut up this outlet of disease, which nature opens upon the surface, for the preservation of the individual, in spite of his own imprudencies, are productive of mischief, and thereby endanger the life of the patient when they accomplish their object, by causing the consequences of the states of the system now described to fall upon an internal viscus? In the majority of cases, the most rational and successful treatment does not depend upon external means; or if in any degree they are benefited by them, it is only in a subsidiary manner. The most safe, and at the same time the most efficient mode of cure is, to deplete generally or locally, according to circumstances; to act decidedly and sufficiently upon the great secreting viscera and upon the intestinal secretions and excretions; to promote the cutaneous functions by warm bathing, vapour baths, and every other means usually resorted to for that purpose; and to put the patient upon light and spare diet, with sufficient exercise. Many of the eruptive disorders proceeding from the particular states of the vascular system, for whose existence we have argued, have been viewed

as syphilitic, and treated accordingly; and in many instances the treatment would necessarily be beneficial. And it is our opinion, that the particular disease which has been called pseudo-syphilis, so ably described by Mr. Abernethy, results from a similar cause. It has, however, been always removed by means which were calculated to diminish plethora, to promote healthy secretion and excretion, and to restore the functions of the different emunctories of the vascular system.

The debility which often accompanies a plethoric state of the system has been a frequent cause of serious and mischievous mistakes on the part both of patient and practitioner. It is generally the necessary result of an engorged or congested state of the vessels, particularly of the veins, and is almost always so combined in the first days of disorder following the impression of the exciting causes of intertropical diseases. It should be looked upon as the earliest symptom of commencing disease; but its cause ought also then to be well understood. There is, doubtless, at the time a depression of the vital and nervous energies; but they are merely kept down by the vascular load which presses upon them, and will spring up again as soon as that load is removed. The heart and the blood-vessels, particularly those of the secreting viscera, are engorged beyond their impelling powers, and the sinuses and veins of the brain and lungs are in a similar state,—thus pressing upon the great nervous centre, and thereby diminishing nervous energy, and interrupting those necessary changes which the blood undergoes in the lungs, and which, if not performed fully and healthily, become the source of further disorder, inasmuch as the circulation of imperfectly purified blood throughout the body and in the brain lessens the activity of the nervous influence and the powers of the system. Debility, moreover, co-existing with plethora, and depending upon it, tends also in a most eminent manner to diminish secretion and excretion, and thus to prolong, and even to increase, the plethoric condition from which the debility arises. The lowered energy of the frame is here merely a necessary sign of the plethoric state, although it also assists in continuing and augmenting this state. Much mischief has consequently arisen from the circumstance of debility being viewed as the only evil, with the removal of which all disorder would cease; and many, acting upon this view, have given tonics and stimulants, have increased the

appetites thereby, and thus augmented the original evil, viz. plethora and congestion, until the state of simple fulness of the vascular system, either locally or generally, and the resulting debility, have been converted into inflammation of some important organ, or an attack of fever. How very different would the case have been, had active and repeated purgatives been given, with gentle stimulants and sudorifics in the intervals; and the requisite depletions, either generally or locally, according to circumstances, with a properly regulated diet and regimen, been instituted. It is true that in many cases of debility, resulting from vascular fulness, and constituting the early stage of intertropical diseases, the powers of the nervous system require to be roused at the same time that the fulness must be removed; but the means of accomplishing the former must be gentle, and the least calculated to convert congestion into inflammation,—a termination to which congestion is extremely prone in warm climates. The debility, therefore, which accompanies a loaded state of the vessels, and characterises the early stages of disease, is not curable by tonics and astringents, but by evacuations, and by those medicines which increase secretion and excretion, which establish a regular and active state of the alvine functions, and which increase cutaneous transpiration; and by a regulated diet and due exercise.

Besides the foregoing conditions, characterising incipient disease, and tending to hasten its progress and aggravate its nature, there are others which require remark. The liver is, perhaps, that organ which feels most the effects of full living, deficient exercise, and the consequent plethora of the vascular system, and which evinces the earliest derangement. Attention should therefore be always directed to this viscus, both by the patient himself, and also by his physician; and a careful watch should be kept over the functions and condition of the organ, by observing the frequency and appearance of the stools, the sensations experienced in the region of the viscus at the pit of the stomach and about the right shoulder. The expression and colour of the eye, and appearance of the countenance and skin, should also be observed; and as soon as any circumstances or sensations indicating disorder make their appearance, judicious means should be resorted to, to avert the consequences which neglect would allow infallibly to supervene. Congestions on the substance of the liver, con-

sisting either of blood in the vena portæ or in the hepatic vein, or of bile in the biliary ducts or gall-bladder, are amongst the earliest consequences of full living on animal food, in warm climates, and insufficient exercise,—are those states of this organ most frequently supervening during the few days which first elapse after the impression of the exciting causes of disease upon the system,—are always attended with an imperfect and disordered state of this secretion,—and almost necessarily are followed, if not judiciously treated, by acute, sub-acute, or chronic inflammations, by bilious diarrhœa or dysentery, or by bilious remittent and continued fevers, as the nature of the predisposition of the individual, or the exciting or co-operating causes, may determine. The bad effects of resorting to stimulants or tonics, in this condition of the biliary apparatus, must be apparent; and the ill consequences now enumerated are more readily brought about by such means. On the other hand, those remedies which unload the liver, either by moderately withdrawing blood or by eliciting secretion, and by promoting the discharge of such secretions as oppress the parts in which they have accumulated, or by occasioning a flow of the circulation to the surface of the body, are the measures which will, together with spare or moderate diet and due exercise, most certainly restore the healthy functions of the organ, and arrest the impending disorder. What the particular means are, which should be adopted in order to fulfil these intentions, we shall have to state at length in the sequel. It sometimes, however, happens, owing to peculiar states of the organ threatened with disease, that the best means which can be used, in order to unload the vascular system when it is greatly oppressed, are followed by increased action, to an extent which threatens the worst consequences: but this cannot be prevented by the adoption of any other measures better calculated to prevent it, as far as our knowledge extends, than a steady perseverance in their employment, directing them, combining them, and varying them, according to the particular circumstances in which we are called upon to employ them. Reaction will sometimes arise in the system generally, and in that organ particularly which has been more immediately oppressed, soon after the load has been removed. But such reaction will be less detrimental when it supervenes upon the judicious plan of diminishing vascular fulness, and increasing the whole circle of the secretions and excretions, than when induced by the imprudent exhibition of heating

stimulants and tonics. The former will merely bring about a salutary reaction, which, if not guarded against, may indeed lead to inflammation of the pre-disposed organ; the latter plan will more certainly induce inflammatory action, which will be less readily controlled, and will more rapidly run into abscess, and thus actually occasion what in the former instance we have only to guard against, or at most to dread.

The state of the tongue is one of the most sure criteria by which our judgment is guided respecting the state of the abdominal viscera and the commencement of disease. When it is foul or loaded, it may then be inferred that the alvine secretions and evacuations are not adequate to the wants of the system, and that they require to be increased, in order to avert impending disorder. It is not sufficient that the tongue shall appear clean over its more anterior surface, but that it shall also be so at its base. It very frequently will be observed, at the commencement of febrile and inflammatory complaints, that, in addition to a foul state of the tongue, the fauces are red and fiery, and uvula relaxed. These appearances are not only indicative of threatened disorder, but also require the employment of alvine evacuations. In conjunction with the foregoing states, the papillæ on the surface of the tongue are often, early in disorder, large, prominent, and excited, and the surface white. This particular condition is frequently connected with a plethoric state of the vascular system and general excitement, and, in the majority of instances, indicates the propriety of general and local evacuations. Not unfrequently the tongue is dark-coloured and of a brown appearance. This is usual at the commencement, and indeed through the progress, of diseases where great prostration of the energies of the system exists, and which are characterised by congestions, particularly on the liver, brain, and lungs, and by a previously neglected state of the alvine functions. Early in disease, also, the tongue is often covered with a slimy mucous coating, which is generally indicative of a foul and loaded state of the mucous surfaces throughout the intestinal canal. This appearance most obviously requires the institution of active purgation, which in many cases should be preceded by the exhibition of an emetic, particularly in cases of approaching fever, and before the febrile excitement is fully formed. There are other states of the tongue and fauces which require attention, as indicating

the commencement and progress of disease,—such as, dryness of the tongue and pharynx, redness of these parts, particularly the edges of the tongue : but these mark more frequently the advancement of disorder, and will be noticed more appropriately in the sequel.

The state of the pulse, as indicating the heart's action, and the general condition of the vascular system, is deserving of the most intimate attention, in the early stages of disease, as one of the best means of ascertaining the existence of plethora, of congestion, and of several of the consequences to which they lead. When the pulse is slower than natural, our attention is at once directed to the state of the functions more immediately dependent upon the brain. But although the pulse is often slow for the first few days after the causes of fever have operated upon the system, and before the febrile symptoms are developed, yet the slowness in such cases seldom is the result of oppression of the brain, but rather of deficient energy of the nervous and vascular systems. At the same time that the pulse is slow during the premonitory stage of fever and inflammatory diseases, it is also then often irregular, and even intermittent, and such is more frequently the case when the commencement of the disease is attended with congestion or impeded circulation in the vessels of the liver. An irregular and intermittent state of the pulse is often met with in individuals who make little or no complaint, and whose only disorder is a plethoric condition of the vascular system and slight signs of derangement about the biliary organs. When this state of the pulse is thus noticed, such curative means should be resorted to as are calculated to meet the exigencies of the case. Generally the pulse, at the same time that it is irregular and intermittent, and particularly when the intermissions are only occasional, and not depending upon organic disorder about the valves of the heart, is also obviously oppressed. This latter state of the pulse should, perhaps, more than any other, put the practitioner upon his guard : for it is very frequently present during the premonitory stage of those diseases which are most prevalent in warm climates ; and it, more certainly than any other sign connected with the pulse, indicates inordinate fulness of the vascular system, and that state of congestion about the great vessels and in the great secreting viscera most prone to become productive of fever or inflammation.

The pulse, if carelessly examined, may often mislead ; and it requires great nicety of tact, and much experience, to discriminate between the various states of the system which the pulse indicates, and the progressive advance of disease. The irregularity of the pulse, which we have noticed as indicating the commencement of disorder, relates to both its strength and frequency. We have generally thought, when the artery makes a few strong pulsations, as if by an effort, and then relaxes into a state of diminished and oppressed action, that a congested state of the internal viscera is present, and that the state of the liver should be inquired into ; and we have often had reason to believe that disease was then commencing in the liver, and that the constitution was, as it were, making efforts at removing the oppressed state of the organ, which would soon be productive of reaction, and even of inflammation of it, if means were not soon resorted to in order to prevent such consequences. Preternatural slowness, with fulness of the pulse, giving the impression of difficulty in the propulsion of the stream of blood, is always indicative of too great fulness of the vascular system ; is generally, as we have already stated, the sign of incipient disease, particularly of fevers, of congestion of the vessels of the head and liver ; and it is a sure guide to the treatment which should be adopted.

Not the least important of all the symptoms which ought to be viewed as premonitory of intertropical diseases, are, the states of the surface of the body, and the appearance of the countenance. As respects the latter, it may be said generally, that whenever its colour, or its expression, in any way differs from its natural character, that disorder should be suspected ; and that the severity and danger of the disorder may be learned, to a great extent, from the manner and degree in which the features and their expression are changed. When the countenance is collapsed, sallow, and languid, then the powers of the system may be viewed as being deficient. This state of countenance is often present during the premonitory period of febrile and inflammatory diseases, and in affections of the biliary organs ; and is frequently accompanied with a muddy or dark state of the skin of the face, and deficient expression and liveliness of the eye. The opposite state of the features, viz. unusual fulness, flushing of the face, and a prominent state of the eyes, with injection of

the conjunctiva, indicate excitement of the vascular system, and the fully developed stage of fever, or of inflammatory action.

With respect to the state of the cutaneous surface, it may be said generally, that a dry, unperspirable, and harsh condition of it, usually ushers in the majority of diseases, and should always indicate the propriety of resorting to active measures, in order to prevent the impending consequences, and to re-establish the perspiratory function. With this state of the surface is often connected unusual coldness; and this is sometimes remarkable during the few days of partial ailment which elapse more immediately upon the first impression of those causes of disease which proceed from the soil and season. This lowness of the animal heat, taken in conjunction with the other concomitant phenomena, serve, most unequivocally, to point out the particular state of the constitution which these causes produce, and the means best suited for its removal. In many cases, and particularly when the period of the full development of the disease approaches, the skin, although dry, harsh, and unperspirable, is as hot, and even hotter, than natural. And even when the temperature is above its usual standard, the patient is often chilly and uncomfortable in his sensations. These feelings generally pass off as the febrile symptoms develop themselves; but when they are present, they indicate approaching disease, which may be arrested by active means, employed appropriately to the circumstances of individual cases, and with due promptness and perseverance on the part of the physician. When, in addition to a cold, harsh, and collapsed state, the surface of the body is covered by a damp, raw, and cold moisture, which is usually the case even at the commencement of the epidemic cholera, the threatened danger is then more urgent, and the means which are then requisite must be more energetic.

To ascertain the approach of disease, and to investigate its nature during its early periods, are objects which are most deserving the attention of the intertropical practitioner, as endowing him, to a great extent, with the power of arresting its progress, by the employment of suitable and energetic means; and, when that cannot be effected, of averting many of its worst or most dangerous consequences. Indeed, to arrest diseases at their first outset,

and thus to prevent not only great consequent suffering, but also, in many cases, fatal results, must, we conceive, be viewed as the most valuable application of medical science.

The observations which we have now made upon the propriety of attention to the premonitory stage of disease, and the suggestions we have offered in order to enable the inexperienced practitioner to detect it in its various forms, are the results of our own observations and experience. We do not bring them before the public as complete in all their bearings, and as amounting to what may altogether be desired upon the subject; but we state them with confidence as to their being founded in truth and in nature; and we offer them to the experienced practitioner as a sketch which his own observation may fill up, and as materials which may awaken in his mind many important suggestions tending to the further elucidation of the subject.

PRACTICAL RESEARCHES
INTO THE
DISEASES OF WARM CLIMATES.

BOOK II.

OBSERVATIONS ON THOSE DISORDERS OF THE STOMACH MOST FREQUENTLY MET WITH IN INDIA AND IN WARM CLIMATES, AS WELL AS AMONG THOSE WHO, AFTER HAVING RESIDED IN THESE COUNTRIES, HAVE RETURNED TO EUROPE.

THE observations which we proceed to offer upon the stomach ailments of warm climates will be more brief than, in the estimation of many, the importance of the subject requires. But disorders of this most important organ are comparatively seldom met with in warm countries in a pure and uncomplicated form; and when existing as primary disorders, they are often not much attended to on the part of the patient until they become connected with, or give rise to, more serious disease,—most frequently of the liver and intestines. Disorders of the stomach are not, however, rare; but they are so generally associated with very important and often dangerous diseases of the adjoining viscera, as to be in a great measure concealed by the urgency of the symptoms of those with which they are complicated; and when they obtain the attention of the medical practitioner, they are often viewed as merely

symptomatic of those diseases. As, however, they sometimes stand forth the prominent disorders, and as they frequently lead, by neglect in their early stages, to those diseases which afterwards mask their existence, and which justly receive the chief attention of both patient and physician, as being the most urgent,—we shall offer such observations as seem to us useful and necessary to be known respecting them, and as experience has impressed us with the importance of, during our long practice in warm climates.

CHAPTER I.

REMARKS ON THE FUNCTIONAL OR PRIMARY DISORDERS OF THE STOMACH, MOST
FREQUENTLY OCCURRING IN WARM COUNTRIES.

THE functional and primary disorders of the stomach are frequently not much attended to by Europeans residing in intertropical countries, being generally viewed by them as the necessary consequences of the climate, and thus allowed to make progress until they produce effects which awaken the apprehension of the patient. This is the great evil to be dreaded from neglecting slight ailments; and such neglect is productive of much mischief in temperate as well as in hot countries. In the latter, however, it is the more deserving of attention and remedy, inasmuch as the consequences attendant upon negligence are here more rapid in their progress, and more injurious to the frame, than in the former. It is chiefly with a view of pointing out the results to which the functional disorders of the stomach necessarily lead, when neglected or improperly treated, and of explaining the way in which these results supervene, in order to put both patient and practitioner on their guard respecting them, that we have been induced to offer any remarks on this species of ailments. These remarks we offer, not as complete in themselves,—for that would be foreign to the scope and limits of the present work,—but as embracing those considerations which are most important to be attended to, as respects both the nature and treatment of those ailments and of the consequences which frequently arise out of them, more particularly under circumstances of neglect or mismanagement.

SECTION I.

Cursory Remarks on the Causes, Symptoms, and Nature of some of the more frequent Forms of Indigestion within the Tropics.

IN order fully to understand the functional derangements of the stomach, it will be necessary that the reader comprehend the healthy operations which this viscus performs, and which have been succinctly detailed in a foregoing Chapter. As soon as the functions of the organ become impaired, the change is indicated by certain signs, according to the number and urgency of which we form our judgment respecting the severity and extent of disorder. The earliest symptoms which present themselves when the functions of the stomach are incompletely performed are, a feeling of oppression and distension, with flatulence and acid eructations after a full meal. These often continue to be present for months, or even years, in temperate climates, without being followed by any more serious disturbance of the system. In warm climates, however, this is less frequently the case, some more serious disorder generally soon supervening, as we shall immediately have to shew. At first, the above-mentioned uneasy sensations are generally got rid of by the patient taking less bulky meals, or more digestible food; for he soon learns to impute his uneasiness to the right cause. But if his appetite happen to be good, at the same time that the digestive powers are impaired,—a very frequent coincidence both within and without the tropics,—it very generally is observed, that he is thereby induced to eat a greater quantity than the stomach will digest, and hence disorder continues to manifest itself. Indulgence in food, beyond the wants of the system and the powers of the stomach, is not only promoted by the state of the appetite, but it is also encouraged by the arts of cookery, as we have already shewn, and by the stimulus imparted by various wines partaken of during the time of eating. Alimentary matter being thus taken in too great quantity in relation to the digestive energy, the secretion of the gastric juice, and the tonic actions of the stomach itself, are inadequate to the production of the healthy changes which the food should undergo before it

passes the pylorus into the duodenum; and hence one of two things must supervene, — either the change of the whole is imperfect, or a part only of the food is converted to healthy chyme, and the rest remains altogether undigested, and ready to undergo those combinations which the chemical affinity of their elements dispose them to enter into when subjected, in a moist or fluid form, to the temperature of the frame. If the former alternative supervene, then an imperfect chyme is formed, which is unfit for the changes which it has to experience in the duodenum and small intestines, when subjected to the operation of the secretions poured into these parts of the intestinal canal; and, consequently, it undergoes those combinations imperfectly and with difficulty, disordering the viscera concerned in the process, and giving rise to an incompletely formed chyle. If the latter alternative take place, that part of the ingesta which is altogether unchanged into healthy chyme, by forming those combinations which the chemical affinities of its elements dispose it to enter into, irritates the internal surface of the stomach, and gives rise to many of those symptoms which constitute the prominent characters of disorder, such as flatulence, acid and rancid eructations, pain and distension of the stomach, cardialgia or heartburn, nausea, vomiting, &c. Such are the more immediate consequences as regards the stomach, when food is taken in too great a quantity for its digestive powers; and these effects continue, or even increase, in proportion as the habit is persevered in. But there frequently arise, even early in the disorder, various morbid phenomena, manifesting themselves in parts remote from its seat. Amongst these, the most deserving of notice are such as supervene in the alimentary canal, and affect its functions. That deranged function of the intestines, and indeed of the adjoining viscera, should accompany, or supervene to, disorder of the stomach, is only what may be expected from the organic connexions of the parts, and the manner in which the healthy action of one organ is dependent upon the due performance of the functions of adjoining parts. Thus, we have generally accompanying the early progress of indigestion, as marked by the symptoms already mentioned, a costive state of the bowels. Indeed, the diminished action of the stomach constituting dyspepsia seldom is confined to this part of the alimentary canal, but extends itself more or less to the whole tube, and to the viscera allied to it in connexion and function. Hence it is that costiveness

and a torpid state of the actions of the liver so generally accompany the early periods of the disorder, and, when allowed to continue, increase the original evil.

Diminished function of a secreting organ or surface is generally followed by a viscid, inspissated, or otherwise disordered state of the secretion itself; and hence we find, in cases of indigestion, that the mouth and tongue are foul and clammy, and the latter covered with a whitish or yellowish fur. The intestinal secretions are also not only diminished in quantity, but they also seem, conformably to the general law now alluded to, very materially changed from their healthy character: they become viscid, tenacious, and, owing to the diminished actions of the mucous surface, they accumulate upon and adhere to it, so as to be with difficulty removed, obstructing those actions which are performed in the internal surface of the canal. Even the repeated operation of purgatives fails in removing the accumulated secretions; and it is not until these remedies have been exhibited for a series of days, that the stools assume a healthy appearance.

When the dyspeptic symptoms have continued some time, the bowels become disordered in a still more marked manner. They are generally at first costive; but this state is often followed by the discharge of some offensive and irritating stools of a lax nature, when they again return to their previous condition. This irregularity arises generally from two sources; first, from the acid and irritating matters formed in the digestive canal, from the imperfectly concocted food; and secondly, from the secretions thrown out upon the mucous surface having undergone some change rendering them more irritating to the adjoining parts, and thus bringing about their discharge. When these conditions of the intestinal secretions and contents are present, the stools are generally extremely irregular, being alternately for many days costive, and for others much relaxed. The stools are also, whether voided voluntarily, or procured by the assistance of medicine, generally very dark, almost black, and frequently very offensive. At other times they assume a greenish brown colour, and exhale an acidulous and disagreeable odour. Occasionally they are pale, often clayey, and of the consistence of soft putty, and, when broken down,

exhibit a variegated appearance. After the operation of a brisk cathartic, they are frequently slimy, and even gelatinous; and they are often clayey, pale, and slimy alternately. The change of colour which thus presents itself has been generally attributed to the state of the bile; and such is doubtless the fact in many cases, but we believe in not so many as is supposed. On the contrary, we have great reason to conclude, that the colour, as well as other appearances of the stools in the various aliments of the stomach, as well as in those of the bowels themselves, depend as often upon the state of those secretions which are poured out from the mucous surface itself, together with the morbid changes which the undigested ailments suffer as they pass through the lower parts of the canal, and mix with the mucous secretions in these situations, as upon the condition of the bile itself.

That the biliary functions and the constitution of the bile become disordered early in the indigestion of warm climates, cannot be denied. Proofs of the fact are too common and too important to be overlooked; but we should not impute effects to wrong causes, or to fewer causes than actually exist, and still less should we fail of endeavouring to connect effect with its efficient antecedent. The same causes which produce indigestion, such as we have insisted upon in a foregoing section,* will most directly tend to disorder the actions of the liver, and the constitution of the biliary secretion. Indeed, so immediately will these causes act upon this important organ, when assisted more especially by a high temperature and indolence, that it will be difficult for the patient himself to feel, and for the practitioner to ascertain, whether or no the stomach or the liver is the primary seat of disorder. Under such circumstances, we have generally formed the conclusion, that both organs are the seat of disorder, and that the antecedence, as regards the period of ailment of each, was so immaterial as not to be taken into account, or require attention in a curative point of view.

In the majority of cases, however, the stomach evinces the earliest signs of disorder, when the testimony it affords is inquired into, or properly

* See the section on Diet, as a Cause of Disease, p. 192.

listened to. But in many instances the symptoms are so slight, and, even when important, so little attended to, that they pass unregarded until the actions of the liver become deranged, and heighten the primary disorder. When this extension of disease takes place, the state of the bowels and the appearance of the stools are matters of great moment, and should undergo the most careful scrutiny of the practitioner. They should not be casually inquired after or looked at, but should be examined by the physician himself; and the nurse should always provide him with a stick, for the purpose of doing so with facility and accuracy. When the biliary secretion is either in excess or deficient, or otherwise deranged, the appearance of the stools will generally betray the morbid change; but the effects of the medicines prescribed in colouring the stools should be taken into account.

In the advanced stages of indigestion, the bowels are frequently disordered in the manner we have already pointed out; and the stools present those appearances previously noticed, in a more marked degree, with all the characters usually denoting morbid states of the bile. Sometimes the bile seems unmixed with the rest of the alimentary contents and fæces, as if it had been suddenly poured out from the gall-bladder, and, from the irritation it had occasioned, been quickly propelled along the intestinal tube, and discharged. At other times, owing to its admixture with the various matters taken in the way of food, drink, or medicine, and with the secretions of the mucous surface of the alimentary canal, it tinges the stools of every shade of colour. Occasionally, when the digestive power of the stomach is much impaired, and is connected with a lax state of the bowels, owing to the irritating combinations which the alimentary matters form in the intestines, pieces of undigested food may be observed amongst the fæces. In this more advanced form of disorder, distension after full meals is frequently severe, and is often attended with a sense of weight and oppression at the pit of the stomach and right hypochondrium, and with obstinate costiveness, followed by numerous loose motions, occasioning much smarting and tenesmus at stool; the motions being at first chiefly hardened and broken-down fæces, and afterwards a dark-brown or greenish-brown fluid, containing pieces of fæces of a lighter colour, and tenacious, putty-like consistence, and sometimes lumps of viscid

mucus. The symptoms in such cases evidently depend upon the diminished power of the digestive process, having extended itself to the whole intestinal canal, occasioning inaction of the colon, and distension of it by the flatus given off from its contents; and likewise to the liver, impeding its actions and locking up its secretions, until, by the re-action of the vital energy upon the sources of irritation thus accumulated, and offending it, the amassed secretions and excretions are at last discharged, occasioning a temporary disturbance of the system, in proportion to the morbid changes which have taken place in them during the period of their undue retention.

In those cases of indigestion which are attended with loss of appetite and occasional nausea, although the patient becomes sooner alarmed, and the pathological condition may be more important, than in such cases as are attended with undue appetite and frequent craving for food; yet the disorder is often sooner removed. For where there is loss of appetite and nausea, there is usually much mental apprehension; hence the patient sooner seeks assistance, and more closely abides by the advice given him. Food, also, being but sparingly indulged in, and that which is taken under such circumstances being generally of a mild quality, the disorder is not perpetuated by indulgence in its chief cause, nor are the functions of the liver and bowels deranged by unduly concocted chyme, and by the irritating materials formed from undigested aliment. When nausea, however, is a symptom of dyspepsia, and still more especially if the nausea is productive of retching and vomiting, the practitioner should then be watchful, and take care to examine fully into the state of the patient. The pulse should receive attention; for if it be quicker than natural, independently of the influence of retching upon it; if there be pain at the stomach or right hypochondrium, either upon pressure or without it, then the following pathological states are to be dreaded,—namely, the indigestion has gone on to produce an inflammatory state of the mucous coat of the stomach, or to occasion inflammation about the concave surface of the liver, or about the duodenum, or the gall-bladder and biliary ducts. It should, however, be recollected, that sickness at stomach, with pain and accelerated pulse, may sometimes be present without resulting from inflammation in the situations now pointed out; for these symptoms sometimes

supervene, in the advanced stage of indigestion, from altered sensibility of the nerves of the stomach, independently of inflammatory action, although more frequently they proceed from this cause. That either condition may exist, more particularly that accompanied by inflammation, should be borne in mind by the practitioner, when the various circumstances of the case, and the aggregate of the symptoms, will guide him in forming his conclusions as to what actually is the proximate cause of disorder.

It is chiefly in weakened and nervous constitutions—in hysterical females and in gouty subjects—that we observe nausea, retching, and pain at the pit of the stomach, unattended by inflammation in some one of the parts already mentioned. The mode of living in warm climates is generally such as is productive of inflammatory action in these viscera; and therefore, when these symptoms supervene in the progress of indigestion, this consequence should be dreaded and guarded against. It should also be remarked, that the signs now noticed may be the consequence of the irritation of biliary calculi, either in the gall-bladder itself, or in the gall-ducts. When such is the case, the state of the pulse, and the seat and kind of pain, together with the appearance of the stools, and sometimes the character of the countenance and surface of the body, will inform the attentive practitioner. In all instances, the kind of pain or uneasiness complained of should be a point of interest: even when it is most urgent, the effect of pressure on the pained part should be tried; and even when it is not present, its non-existence should be proved by firm pressure, the practitioner causing the patient to make a full inspiration at the time when pressure is being made.

In every case where nausea, loss of appetite, and occasional retching, mark the progress of indigestion, the matters ejected from the stomach should be carefully examined; as upon the appearances which they exhibit, we are enabled to draw most important inferences respecting the lengths to which disorder has extended, either in the stomach itself or in the adjoining viscera, as we shall have to shew in the sequel.

During the progress and advanced stages of indigestion, the sensibility of

the whole nervous system is increased, the frame is more sensible of changes of temperature, and more susceptible of the impression of cold. The skin generally becomes dry and harsh when the temperature is at all lower than that of the surface of the body ; and slight exposures to chills, or to a colder or moister air than usual, are productive of bowel complaints. Headach frequently occurs, the sleep is often disturbed, and the spirits generally dejected.

It is scarcely requisite to instance further the various phenomena that supervene upon impeded function of the stomach. Those symptoms which are most important in their nature and tendency have received all the attention our limits may allow. To those who wish further to inform themselves on the subject, especially as respects temperate climates, we can recommend the works of Mr. Abernethy, Dr. Philip, Dr. Paris, and Dr. Johnson. The next part of our subject, the *causes* of imperfect digestion, will not detain us long. They are so obvious, both as respects their existence and tendency, as scarcely to require to be enumerated. Many of them have been already adduced in the foregoing sections of the work ; and those which may be further alluded to here require little or no comment.

The *Causes* of indigestion embrace all those agents which tend, either directly or indirectly, to exhaust the energies of the body generally, or of the stomach especially. Many of these causes influence the digestive process only through intermediate effects produced upon the frame. Others operate directly upon the stomach and the other viscera concerned in the digestive function. Of these latter, many act by exhausting the nervous powers of the stomach, having previously excited them to an undue pitch. Others, again, produce their hurtful effects in a more mechanical manner, by over-distending the stomach, and thus weakening its contractile powers. Some sources of mischief present themselves to this organ in forms which either over-dilute and weaken the power of the gastric fluids, or oppose by their consistence the action of these solvents. A numerous body of materials is received into this organ, which directly excite the nerves terminating in its internal surface, irritate the blood-vessels in the same situation, and thus produce and perpetuate the disorder under consideration, and hasten the supervention of

disease in the adjoining viscera; and the whole catalogue of edible matters and of beverages, when taken in a proportion above the power of the stomach to dispose of, or combined into forms unfavourable to its functions, or mixed up into incongruous compounds,—as is very often the case,—instead of being changed into a healthy chyme, very frequently forms acid, acrid, and even rancid combinations, which excite the sensibility of the organ, and irritate its blood-vessels; and at last, owing to the reiterated production of these effects, inflammation of the stomach itself, or of its mucous surface, is the consequence, as well as disease of adjoining parts, produced in a way which we shall immediately explain.

The causes of indigestion, then, are, 1st, those which act upon the stomach indirectly, or by intermediate effects produced upon the body; and 2dly, such as directly invade the stomach itself, and are actually present in the viscus which they disorder. Amongst the latter class of causes, there are few more important in their direct effects and more remote consequences than those which have been already enumerated in the observations contained in previous sections of the work. In our remarks upon the necessary consequences of an imperfect mastication of the food (p. 18); of partaking of too great a quantity of liquids or of fluid aliment during meals (p. 20); of eating much animal food, and rich and highly-spiced soups, curries, and made dishes (p. 195),—the most direct and frequent causes of the functional disorders of the stomach were adduced. The observations which we offered, also, upon the ill effects resulting from want of due exercise, are also equally applicable here, as a principal cause of indigestion. Indeed, the circumstances instanced in the section on diet and regimen as a cause of disease, are not only those whence dyspepsia most frequently derives its origin, but they are also those causes which are shunned with the greatest difficulty, which continue to exert their influence generally for a protracted period, and the effects which they produce often themselves generate a desire for a continued indulgence in them, until such indulgence increases the disorder to that pitch which alarms the patient, and hastens the generation of those diseases which derive their origin from the primary disorder now under consideration. Constituted as human nature is, those causes of disease which are in any way related to the wants and appetites

of the frame, and to the gratification of the senses, and those more especially which, at the same time that they satisfy the almost hourly recurring appetites, gratify those senses which most frequently seek for indulgence, will be the most frequently present, will exert their influence the longest, will consequently lead the oftenest to disease, and tend the most to perpetuate or to exasperate it, of all the causes of disorder depending upon the feelings, conduct, and actions of individuals.

The functions of the stomach are injured, not only by those causes which act directly on it, but by those influences also which impair the energy of the whole system. Of these latter, the most generally and continually operating are terrestrial exhalations. The depressing passions and anxieties of mind, also, although less general in their operation, are yet most efficient in the production of dyspeptic as well as of hepatic disorder; and when the former is the result of this cause, the latter disease is generally a concomitant.

In warm climates, and more particularly in the East, the supervention of biliary derangements upon disorders of the digestive function, is a consequence to which almost every experienced practitioner is alive; but still the subject is not the less deserving notice. The disorder of the stomach, which usually accompanies hepatic complaints, and often indeed produces them, is, however, too frequently overlooked, and the connexion disregarded, both in our speculations and practice. A similar remark may also be made respecting the origin of several disorders of the bowels. As, therefore, disorders of both the liver and of the intestinal canal very frequently supervene to functional ailments of the stomach, we shall conclude this section with some observations upon the nature of these complications, and the manner in which the disorder of the one organ seems to us to derange the functions of the adjoining viscera.

A torpid state of the liver usually accompanies the imperfect performance of the digestive function, especially early in the complaint. This is in a great measure owing to the existence of a similar state of deficient energy of the vital actions of the liver to that which characterises indigestion. During this state of torpid function, the ingesta are retained longer in the

stomach than in the healthy condition of the organ, in order that they may undergo the necessary changes; at the same time, the bile is secreted in less quantity, or if it be secreted as abundantly as usual, it is frequently retained longer in the ducts and gall-bladder; and hence it accumulates in these situations, and flows more sparingly into the duodenum. The result of this must necessarily be, that the chyme is slowly or imperfectly converted into chyle, and that the digestive process is retarded throughout the whole alimentary canal. A torpid state, however, of the liver, in warm climates generally, and in the East Indies more particularly, can be only a state of temporary disorder; but it is one necessarily tending to the production of ulterior disease. For, as the elements of which bile is formed abound in the blood, the secretion of this fluid will generally proceed sufficiently fast to load the gall-ducts and bladder to a degree which will either occasion its expulsion into the duodenum, or will irritate and excite the vascular actions of the liver itself; and the frequent production of these effects will necessarily occasion inflammatory disorder of the organ. But it is not only the simple accumulation of bile which is hurtful, when the energy of this viscus is insufficient to rid itself of its load; it is chiefly the morbid change which the constitution of the bile undergoes when thus retained which is productive of disorder, both of the liver itself and of the bowels into which it is poured. During the remora of the bile in the biliary ducts and gall-bladder, it becomes inspissated, darker in colour, and more acrid as respects its effects upon sensible structures. Hence the tendency to the supervention of inflammation upon torpid states of this viscus, both in the liver itself and in the mucous coat of the intestines, after the acrid bile has been let loose into them. Thus it will be perceived, that we consider functional disorders of the stomach not only important in themselves, but also most deserving regard, as inducing disorder of the liver, tending to inflammatory disease of this viscus and of the mucous surface of the bowels.

We have already alluded to the manner in which too much food, or matters of an improper, an irritating, and an exciting nature, occasion indigestion, and aggravate it when it is already present. This is owing to the acid, acrid, and rancid compounds to which such ingesta give rise, particularly when

taken beyond the digestive powers. But indulgence in this kind of diet, especially when it is in excess, is not only hurtful to the nervous energy and functions of the stomach, it is equally injurious to the liver and intestines. For when the materials taken into the stomach are not converted into healthy chyme, but enter into irritating combinations, they necessarily are in an undue state of preparation for the changes they have to undergo in the duodenum, and are even sources of irritation and disturbance to the internal surface of this intestine. So intimately, also, are the liver, spleen, pancreas, and small intestines connected, both by blood-vessels and nerves, that whatever continues to excite or disturb the sensibility or actions of one, will necessarily disorder the others; and when the substances taken into the stomach, and afterwards transmitted to the duodenum, either from their nature, their quantity, or their combinations, irritate the sensible surface of these viscera, disorder will naturally be transmitted still farther, and the ducts which open into the duodenum will participate in the disturbance, and thence it will be propagated to the organs from which these ducts are sent. Thus other important viscera will be drawn into a participation of the disorder, which at first will be generally functional, but which will soon induce the most important organic lesions. But as all matters which are poured into the duodenum remain there only a short period, and pass on through the rest of the alimentary canal, a similar disturbance to that occasioned in its upper portions will be also produced throughout the whole; and hence we shall have cholera, diarrhœa, and even dysentery, supervening to the stomach disorder, as well as derangement of the functions of the large secreting viscera.

In the remarks which we offered on the digestive process in a former chapter (see pp. 29 and 30), it was stated, on the authority of various eminent physiologists, that a considerable portion of the materials contained in the alimentary canal, particularly the chyle and the more fluid or aqueous parts of its contents, were taken up by a set of absorbents, which conveyed them into the branches of the vena portæ, and that they passed immediately to the liver, along with the blood circulating in the portal circle of vessels. Such being the case, the injurious influence of stimulating, irritating, and indigestible substances upon the functions, and even upon the structure of the liver,

becomes apparent, as well as the individual links of that chain which connects the diseases of the liver to those of the stomach and small intestines. For if irritating materials be absorbed from the stomach and alimentary tube, and carried directly into the blood of the vena portæ, — a conclusion which cannot be altogether denied, — a constant source of irritation must be thus present to the liver, and in some degree to the other abdominal and the thoracic viscera ; and thus we find indigestion, and the causes upon which it usually directly depends, and by which it is perpetuated, the chief sources of hepatic derangements.

It is unnecessary to examine at this place the connexion of disorder any farther. Whatever we may have overlooked respecting it, will, perhaps, occur to us when we state the result of our experience on the diseases of the liver and bowels. At the same time, we may so far anticipate what we may have to advance respecting the disorders of the duodenum and small intestines, as to state, that the duodenum may be disordered, and very frequently is so disordered, in a similar way to the stomach ; that its functions may be impaired, and, consequently, that the changes which the matters poured into it from the stomach should undergo may be imperfect ; and that this effect often arises from the same causes as those which similarly derange the functions of the stomach. When such is the case, the indigestion accompanying it is heightened by the complication, and all the consequences now insisted upon thereby promoted. As, however, the digestive process in the duodenum is in a great measure dependent upon the state of the secretions poured into it from the liver, and this upon the condition of the liver itself, we shall defer farther notice respecting disorder of the duodenum until the diseases of the liver and biliary apparatus have come before us. We next proceed to offer some cursory observations on the treatment and regimen of primary disorder of the stomach.

SECTION II.

Cursory Observations on the Treatment and Regimen of the Functional Derangements of the Stomach in Warm Climates.

THIS subject will not necessarily occupy much space, as we shall confine our observations to the treatment of the functional disorders which supervene in a primary form, and reserve what may be stated respecting their complications with the diseases of the liver and bowels, until we come to consider the treatment of these maladies.

In warm as well as in temperate climates, the first object of the practitioner is, to ascertain, as closely as is in his power, the causes productive of disorder, and the extent of derangement, as respects both the stomach itself and the adjoining viscera, which these causes have induced. The next point to which he should direct his views is, to remove these causes as far as he possibly can, and to institute such a course of medical treatment and regimen as the circumstances of the case require. The causes which we have chiefly insisted upon, as productive of stomach disorder,* are those which should be especially removed; and this object having been insisted upon, with due decision on the part of the medical man, the following indications ought to be kept in view, in the exhibition of medicinal means,—namely, to remove the more urgent symptoms and complications which each case presents; to restore the impaired energy of the digestive functions; and to prevent a recurrence of the disorder.

The first indication can never be entered upon with any hopes of permanent success, whilst the patient is allowed to indulge in those habits and courses from which the disorder springs. So long as he is allowed to over-

* See preceding Section, pp. 235 and 236.

load and over-stimulate his stomach, the practitioner will prescribe the most efficacious remedies in vain. A light, low, and a bland diet ought therefore to be adopted before any medicine is taken; and this should be particularly and decidedly laid down by the practitioner, and a regular plan of diet and regimen entered upon by the patient previously to, or at least contemporaneously with, the exhibition of medicine. This being premised, the various urgent symptoms and morbid associations which have supervened, should next be combated by suitable means. The acid and acrid eructations, which often prove hurtful after meals, will generally disappear as soon as a mild diet is adopted, and the quantity of the food reduced, so as to be in relation to the digestive energy of the stomach. If, however, this symptom should still continue, gentle tonics may be combined with antacids and aperients, and a pill, consisting of a grain and a half of blue-pill, and three grains of aloes, or of the aloes and myrrh pill, may be taken every night. The functions of the liver are very seldom unimpaired in the dyspepsia of warm climates; the treatment, therefore, should always be directed with some reference to the presumed condition of that organ. If it be in a torpid state, as is frequently the case, and still more especially if there seem to be a loaded condition of the biliary apparatus, unattended with an inflammatory state of the mucous coat of the stomach, then the treatment may be advantageously commenced by the exhibition of an ipecacuanha emetic; for greater benefit will be derived from the influence of retching, in procuring the expulsion of the bile from the loaded gall-bladder and biliary ducts, and in favouring a free circulation through the substance of the liver, than mischief can arise from the operation of the medicine upon the functions of the stomach itself. Whatever means may be pursued in order to remove the dyspeptic condition, but little progress will be made towards effecting a cure, as long as the functions of the liver and bowels are allowed to remain in a disordered condition. When the bile is secreted in an insufficient quantity, then small doses of the blue-pill, in combination with aloes, may be given nightly, gentle tonics and aperients being exhibited throughout the day; and this plan should be persisted in for a considerable time, and until all disorder is removed. In such cases as are characterised by irregularity of the alvine excretions, and by a morbid state of the biliary secretions, ten or fifteen grains of blue-

pill may be exhibited with advantage every second or third night, and an aperient draught, consisting of equal parts of the compound infusions of senna and of gentian, with a little of the compound tinctures of aloës and of cardamoms, may be taken every morning; and when the secretions and stools are much disordered, a drachm or two of one of the neutral salts may be added to this draught, with great advantage. It will be generally observed, that this class of cases is most frequently met with amongst those who live upon much animal food and rich dishes: attention should, therefore, be paid to the diet of the patient; and the practitioner should be particularly decided in his directions as to this point. If he fail in restricting his patient to simpler and lower fare, he must be the more pertinacious in the exhibition of aperients, and in the recommendation of active exercise. The institution of a regular course of aperients, and, in many cases, even of active purgation, should always be kept in view; and, in order that the functions of the stomach may not be disordered by the exhibition of such cathartics as possess acrid or irritating properties, the operation of those which are less offensive to the energies of the digestive organs should be promoted, by the use of injections, which the patient may himself administer, by means of the apparatus which has been lately invented for the purpose. In cases of dyspepsia, attended with greater disorder of the functions of the liver and bowels than that which has been now considered, ten, fifteen, or twenty grains of calomel may be substituted for the blue-pill, recommended for the foregoing cases; and, in addition to the other means, a large blister may be placed upon the epigastric and right hypochondriac regions. Where the functions of the liver and bowels are much disordered, and especially when such disorder is characterised by an increased as well as a morbid state of the bile, the diet should then chiefly consist of farinaceous substances; little or no animal food ought to be taken; and active purgation should be resorted to, until the secretions contained in the stools assume a healthy character. As long as they present the appearances described in the preceding section,* a deobstruent mercurial pill may be given with advantage every night, and an active purging draught the following morning; and this plan should be continued

* See page 232.

until all disorder ceases. We should not be led astray by the appearance of the motions voided on the first or second day of the purgative course; for it very frequently happens, that the purges at first given accomplish no more, during that period, than the unloading of the colon and ilium of a part of their contents, and that part may not betray much disorder; and yet, after persisting in the use of purgatives for a day or two longer, the accumulated secretions, which have long remained locked up in the gall-bladder and biliary ducts, and adherent to the mucous surface of the alimentary canal, and the fæces and morbid secretions which have been long lodged in the cæcum and colon, are at last let loose; and we often find, that measures necessary for the removal of them must be pursued even for a long series of days before the healthy state of function is restored.

Much mischief has arisen from the mistaken notion, that the very disordered state of the stools which is frequently present in the advanced stages of disorders of the digestive organs, is often the effect of the medicines which have been exhibited. But although the purgatives employed may change the colour of the motions, they by no means occasion the other morbid appearances they frequently present. Indeed, the colour, even when most opposite to the healthy tinge, if it arises at all from the operation of the medicine, can only result from its action upon secretions already of a very morbid condition. Their odour, putty-like consistence, variegated or marbled colour, dark-brown, greenish-brown, and inky appearances, and their viscid, tenacious, gelatinous, and often scybalous conditions, are generally by no means the result of the medicines employed, farther than that they promote their expulsion, in different grades of fluidity, from the bowels. These various characteristics generally proceed from a vitiated state of the biliary and other secretions poured into the alimentary canal; and this arises from their long retention and accumulation upon the mucous surface: so that when they mix and combine with the fæcal matters passing through the colon, states of disorder, such as those to which we have alluded, are produced.

It not infrequently happens, that states of congestion in the liver, and of inflammatory irritation of the mucous surface of the stomach, supervene

in the advanced stage of indigestion. When such is the case, purgatives and enemata may be exhibited, a low and bland diet adopted, and leeches applied near the situation where fulness, weight, distension, and soreness indicate the existence of those forms of disorder. After these means have been adopted, medium doses of the blue-pill may be given at bed-time, and saline medicines, with gentle doses of antimonials, through the day, and a blister applied near the seat of uneasiness. In some cases of protracted indigestion, great fulness is observable in the situation of the cæcum, and in the course of the colon, particularly the sigmoid flexure, owing to inattention to the state of the bowels and habitual costiveness. The dyspeptic complaint may be considered in some respects as a consequence of this torpid condition of the large intestines, although it is more frequently a cause; but, however originating, there can be no question but that this state of the colon aggravates the disorder of the stomach, and should be removed as soon as possible. For this purpose, few better medicines can be prescribed than the combination of blue-pill and aloes, given at bed-time, and the bitter aperient draught taken in the morning, as already noticed. The effects of these remedies will be advantageously promoted by the use of the soap-injection, or of the common gruel enema, in which some common salt may be dissolved, and a little assafoetida rubbed down. These injections should be well thrown up, by means of one of the syringes lately brought into use for the purpose.

Amongst other symptoms which require removal, heartburn and acidity are the most troublesome. When these depend upon the quantity, richness, and irritating nature of the food, then the means of removing them are obvious. But they do not always proceed from this cause: they frequently seem to arise from a state of inflammatory irritation of the mucous coat of the stomach, and a deficient secretion of the gastric juice and mucus. The consequence of these conditions is, that the aliment is not converted into healthy chyme, but undergoes those changes to which its chemical affinities and the temperature of the body dispose it to enter into. These combinations being of an acid and irritating nature, the nervous sensibility of the organ is excited, and thus heartburn and pain in the stomach are produced. It is usual, in this

variety of disorder, to prescribe antacids, which merely neutralise the acid which is formed, but which often increase that state of functional disorder upon which the acidity depends. Antacids are, notwithstanding, useful in such cases; but not as the chief agents—they are merely subsidiary means. They should be combined with aperients, and with such remedies as are best calculated to promote the healthy function of the liver and bowels. As an antacid, the carbonate of ammonia has generally seemed to us the best, especially when given with the liquor ammoniæ acetatis, in any mild aromatic water, or in the simple decoction of sarsaparilla, or compound barley decoction. In all such cases, the state of the bowels should be attended to, and the operation of the gentler and more tonic aperients, which are here best adapted to the functions of the stomach, may be promoted by the occasional use of enemas, composed of ingredients similar to those already specified, or of the decoction of camomile flowers, with some aperient extract dissolved in it.

Flatulence is another symptom which often occasions considerable distress, and even acute pain, in the advanced stages of dyspepsia. It will, however, be generally removed by the means already pointed out, more especially by a regularly open state of the bowels, and by the combination of aromatic and antispasmodic remedies with aperients and antacids. Where flatulence is frequently present to a great degree, we should always suspect the existence of a torpid state of function of the liver, with inactivity of the cæcum and colon; and we should therefore extend our remedial agents to these viscera, as well as to the stomach itself. The use of injections is here necessary, in order to unload the colon, and prevent the accumulation of fæces or morbid secretions in its cells.

Having relieved the more urgent symptoms, we should next endeavour to impart strength to the digestive organs, and, through them, to the frame in general. The means which we have particularised will be productive of this result to a certain extent, particularly those which unload the alimentary canal of the offending materials which have accumulated in it, and impaired its energies. Until these be removed, it will be in vain that we

shall attempt to give strength to the digestive organs ; for whatever means we employ, if they accomplish not this effect, will frequently disorder the system, and be productive of general febrile irritation. In some cases, however, particularly in those who are much debilitated, tonics may be advantageously combined with aperients, or be alternately prescribed with them. But in all cases, the tonics employed should be at first of the mildest kind, and the least calculated to heat the system. Stimulating and heating tonics, when prescribed before the strength of the digestive organs is in some degree restored, are generally hurtful, productive of thirst and fever, and often lead to the supervention of inflammatory disorder of the liver. Weak infusions of calumba root, gentian, or camomile flowers, are at first the most suitable of this class of remedies to debilitated subjects ; but as the strength returns, the cinchona bark, or cascarilla, with soda, may be prescribed with advantage. The sulphate of quinine may likewise be given in small doses ; but, unless for the purpose of arresting the progress of intermittents, it is generally detrimental when taken in large doses, or when the use of it has been long persisted in. Even small doses, when prescribed for those who are liable to disorders of the liver and bowels, create considerable heat of skin and accelerated pulse. Its astringent effects are also such as require the exhibition of aperient medicines. In all cases of dyspepsia, whatever be the symptoms or complications attending upon it, tonics even of the gentlest description should be combined with gentle aperients ; and when the functions of the liver and bowels are torpid, and still more especially if their secretions be morbid, suitable purgative remedies should be exhibited, at the same time that the strength of the digestive organs is promoted.

The *Shayraet*, (the *Gentiana Chirayita* of Roxb.), or wormseed plant, is one of the best tonics generally used in India, and is well suited to the dyspepsia of weak persons, on account of its bitter and tonic properties, and the absence of any heating or irritating qualities. It may, as well as the common gentian, be used advantageously in combination with senna, for infusions ; and, either with or without this latter, it forms, when thus prepared, an excellent vehicle for other tonics, or for aperient remedies, in the stomach and bowel complaints of warm climates.

Having removed the more urgent symptoms present during the advanced stages of indigestion, and having restored the energy of the stomach, and regulated the functions of those viscera which are subsidiary to this organ, the last indication which was proposed is, to prevent the return of the disorder, by adopting that diet and regimen which the circumstances of the case seem to require. Persons who have once suffered from derangements of the digestive organs are extremely liable to a return of them, even after they have been completely removed by medical treatment, upon the least error in diet, and after any indulgence at table beyond the ordinary habits of the individual. On this account, the patient's prudence should never forsake him. His diet ought to be simple, consisting of few articles, plainly dressed, and easy of digestion. The appetite ought not to be seduced, either by the arts of cookery, or by the stimulus of wines or liquors, to attempt more than its natural energies enable it to perform. Animal food may be taken once a day in moderation; and if active exercise be indulged in, it may be partaken of twice, provided that the appetite desire it. Exercise, in order to be beneficial to those who have a weak digestion, should be regular, moderate, and resorted to at suitable hours of the day. Exposure to the sun ought to be avoided, and the exercise should always be short of fatigue.

Persons who are disposed to indigestion ought to pay a rigid attention to the state and regularity of the motions. The bowels should be kept freely open; and upon the first appearance of disorder in them, or of a deficient or otherwise morbid condition of the biliary and intestinal secretions, aperient remedies, suited to the particular kind of disorder present, ought immediately to be resorted to, and the healthy functions of the colon promoted by the occasional use of injections. The recommendations already offered in former sections may farther be inculcated and pursued, as the circumstances of individual cases may require.

CHAPTER II.

OF INFLAMMATIONS AND ORGANIC LESIONS OF THE STOMACH, WITH REMARKS
ON THE USUAL APPEARANCES UPON DISSECTION, AND THE MOST APPROPRIATE
MEANS OF CURE.

SIMPLE and uncomplicated inflammation of the stomach is, in our opinion, an extremely rare disease, both in warm and temperate countries. Upon referring to our case-books, which contain many thousand cases, reported at length, we could find but very few in which phlegmonous or acute inflammation of the substance of this organ was present in an uncomplicated form. It must not, however, be inferred from this, that the stomach is rarely inflamed. As respects the European residents in India, this is far from being the case; for this viscus very frequently becomes the seat of inflammation, particularly as respects its mucous coat, owing to the extension of morbid vascular action from adjoining parts. It is only as a primary, an acute, and an uncomplicated disease, that gastritis is rarely met with. As it occurs within the tropics, it is generally complicated with disease of the liver, spleen, or small intestines, these organs having been the primary seat of inflammation, and the vascular disorder having extended itself to the stomach, owing to the operation of those predisposing and exciting causes whence gastritis usually proceeds. Inflammation of the stomach, however, may originate primarily in this organ, and even in a few cases be productive of disorder of the adjoining viscera. But this is seldom the case in the very acute or phlegmonous form of the disorder. In that form of gastritis which has its seat in the mucous coat of the stomach, and which is more insidious and more chronic in its progress, the extension of disease to other viscera is a much more frequent occurrence.

SECTION I.

Of the Symptoms and Causes of Inflammations of the Stomach, with the Appearances upon Dissection.

WHEN inflammation commences in the mucous tunic of this organ, and is confined to this texture, its symptoms and progress are very different from those which characterise inflammation of the substance of the stomach. The former variety of the disease, which has usually been denominated the erythematous or erysipelatous, is often insidious and indistinct until very serious organic lesion has supervened. The latter is, on the other hand, most alarming in its aspect, and quick in its progress; and tends generally to a fatal termination, if not arrested by judicious means. The one is slow, and often obscure; the latter most acute, and well marked. In order to convey to the reader with greater precision what we have to state respecting these two forms of inflammation of the stomach, we shall first offer some remarks upon the erythematic variety of the disease, and next treat of the acute or phlegmonous form, which it less frequently assumes.

The chronic or erythematic form of gastritis is generally confined to the mucous coat of the stomach, and, in its slighter grades, is, in our opinion, a much more frequent form of disease in warm climates than is usually supposed. It supervenes, we are most thoroughly convinced, to a greater or less extent, in the advanced stages of dyspepsia,—many of the more urgent symptoms of this disease being the result of an inflammatory state of the mucous coat of the stomach. It is also present in many cases of bilious inflammatory fever; and in these it may be considered as being generally induced by the flow of acrid and irritating bile into the stomach.

The symptoms more generally indicating the existence of this form of disorder are, heartburn, pain in the region of the stomach, particularly after

eating, and accompanied with a sense of constriction. There are generally present slight fever and thirst,—a red state of the fauces and edges of the tongue, whilst its surface is covered with a whitish or yellowish coating,—and a variable state of appetite. At first, the desire for food is not much diminished; but the digestion is slow and painful, and accompanied with acrid, acid, and rancid eructations, and occasionally with vomiting. As the disease advances, the appetite disappears; there is frequent vomiting, with periods of comparative comfort, when food is entirely avoided, or taken in small quantity, and of mild quality. Attending this there is also much thirst, and a sense of heat about the præcordia and pit of the stomach. The functions of the bowels are often not much disturbed; they are sometimes, however, slower than natural, and occasionally diarrhœa is present. As the disease advances to ulceration, the pain, heat, and vomiting, become more urgent. Cardialgia and constriction at the pit of the stomach are more frequently present; the patient becomes emaciated, and the fever assumes more of the hectic characters. The matters ejected by vomiting early in the disease consist at first only of the substances taken into the stomach; subsequently they are mucous and glairy; and sometimes small whitish flocculi may be noticed in them. Soon after ulceration has supervened, which, in our opinion, commences in the mucous follicles with which the villous tunic is studded, the matters thrown off the stomach usually consist of a dark-coloured, grumous fluid. Vomiting and pain now become more frequent and more constant upon the ingestion of food or drink; and at last the patient sinks under the disease. On some occasions, this event is accelerated from the laceration of the bottom of some one of the larger ulcers, and the consequent irruption of the contents of the stomach into the abdominal cavity; peritonitis thus being produced, in addition to the former disease,

Inflammation of the mucous coat of the stomach may exist to a considerable extent without any complaint being made either of pain or sickness, and even, in some few cases, without the appetite being much disordered; but cardialgia, acid and acrid eructations, sense of heat and constriction, with slight fever and occasional anxiety at the præcordia, are generally present:

and as soon as ulceration has supervened, then all the symptoms we have noticed as indicating this event are usually present. Much mischief has arisen, in our opinion, from the very exclusive manner in which the above symptoms have been ascribed to the worst forms of dyspepsia by nosologists, as if they were characteristic only of that disease. Although marking such disorder most undoubtedly, they seem to us as unequivocally to point out the existence of inflammatory irritation of the mucous coat of the stomach, particularly when they are constantly present, and attended with slow fever.

As this variety of disease seldom comes before the pathologist in his *post mortem* investigations, until it has gone on to ulceration, or the production of other morbid lesions, little can be said of its anatomical characters, further than as respects its consequences. Upon dissection, the coats of the stomach have been found thinner and softer than usual, at the same time that the villous coat has presented various traces of inflammation. In other cases, ulcerations of almost every dimension, and numerous in proportion to their minuteness, have been found conjoined with a thinning and softening of the tunics. In other instances, the coats of the stomach have been thicker and softer than usual, and the viscus more contracted; and marks of inflammation and ulceration have been found conjoined to this state. The ulcerations have been observed of various depths and sizes. Occasionally they have been very small and numerous; in other cases large and few. Sometimes they scarcely reached, as respects depth, the cellular substance connecting the mucous with the muscular coat of the stomach; at other times they have destroyed all the tunics, excepting the outer or peritoneal covering, which had given way in one or two places before the retchings attendant upon the last stage of the disease; the contents of the stomach having escaped through the opening thus made, and produced peritoneal inflammation. The ulcerations have been generally most numerous near the pylorus, and at the cardiac orifice of the viscus. The following case will illustrate the intimate relation existing between this disease and the worst cases of dyspepsia occurring between the tropics, it having been mistaken for the common form of indigestion, until shortly before the death of the patient.

CASE I.—*Inflammation of the Mucous Coat of the Stomach supervening to Dyspepsia, and terminating in Ulceration.—Dissection.**

WILLIAM SPARKS, admitted 19th of June, 1815.—Returned from field service much emaciated, and extremely languid. Has been complaining for some time of dyspeptic symptoms, with occasional attacks of fever. Countenance sallow; tongue foul; some purging, without pain; no fulness in the hypochondria; pulse 78; skin warm and moist. Has used wine with tonics.—R Mist. amaræ, (infusi gentian. comp.) ℥j.; tinct. cinchonæ, ℥ij.

22d.—Bad taste of the mouth, with nausea and general sickness; no desire for food; bowels rather open.—Capiat Pulv. ipecacuan. ʒj. pro emetico. Take at 11 o'clock, A.M., Mist. amaræ, ℥jss.; tinct. ferri mur. ℥xij.

Evening.—Threw up some dark, grumous fluid after the emetic; several stools.—R Aq. menth. pip. ℥jss.; tinct. calumbæ, ℥jss.

* In order to enable the reader better to understand the treatment adopted for the cases detailed, which are extracted verbatim from the Hospital Diary, we shall subjoin some of the formulæ for those medicines which were usually kept in a state of preparation. The formulæ of the London Pharmacopœia were also adopted as circumstances required.

Mistura Cathartica.

R Infusi Sennæ, ℥ij.
Tamarindorum,
Magnes. Sulphatis,
Potassæ Supertart. āā ℥ij.
Antimonii Tartarizati, gr. ij. M.

Mistura Cathartica Composita.

R Infusi Sennæ, ℥viiij.
Mannæ Optimæ,
Seminis Carui, āā ℥ss.
Magnesiæ Sulphatis, ℥j.
Tincturæ Sennæ,
—— Cardamom. Com. āā ℥j. M.

Mistura Purgans.

R Infusi Sennæ, ℥ij.
Tamarindorum,
Mannæ Opt. āā ℥ij.
Potassæ Supertart. ℥ij.
Antimonii Tartarizati, gr. iij. M. ft. mist.

23d. — Feels pretty easy this morning; pulse is slow and languid. — R Infus. gentianæ comp. ℥jss.; tinct. ferri, ℥x. twice a day. Continue the wine.

24th. — Repeat the draughts twice a day, and wine.

26th. — Takes his draughts and wine; appears to be declining; debility increases; bowels loose. Continue draughts and wine.

Evening. — Seems much worse; some hiccup, and the pulse at the wrist nearly gone; debility extreme. Continue the wine. — R Mist. camphorat. ℥jss.; spirit. æther. nitros. ℥ij.; aquæ, ℥vj. M. statim. Blisters to the insides of the legs.

27th. — Died this morning.

Dissection. — The coats of the stomach were much thinner than natural; the villous coat was found covered with small and numerous superficial ulcerations, which were still more numerous near the cardiac orifice; they discharged a thin brownish fluid,

Mistura Amara cum Sennâ.

R Infusi Gentianæ Com. ℥xij.

—— Sennæ, ℥vj.

Tinct. Cardamom. Comp. ℥jss. ad ℥iij. Interdum adde
Magnesiæ Sulphatis, ℥ij. M.

Mistura Camphoræ.

R Camphoræ, ℥j.

Spirit. Vini Rect. ℥x.

Sacch. Alb. ℥ss.

Aquæ Ferventis, ℥bj. M.

Mistura Salina.

R Succī Limonis, ℥ij.

Potassæ Subcarbon. ℥jv.

Aquæ Ammoniæ, ℥xxx.

Spirit. Æther. Nit. ℥ij.

Aquæ Puræ, ℥bj. M.

Mistura Salina Composita.

R Succī Limonis, ℥ij.

Potassæ Subcarbonat. ℥jv.

Aquæ Ammoniæ, ℥ss.

Spiritûs Ætheris Nit. ℥ij.

Vini Antimonialis, ℥iij.

Aquæ Puræ, ℥bj. M.

which was very fœtid : the liver and spleen were sound. The small and large intestines appeared healthy.

Remarks.—This patient had been detached with his company on field service, where he was first taken ill, and returned to his regiment, seemingly without any account of his previous treatment, by the medical officer under whose charge he was ;—a practice by far too common in India, and one that should assuredly be corrected. He came under the care of the assistant-surgeon of the regiment in our absence on staff duty, and who, although a well-educated physician, seems to have misunderstood the nature of this case in its present shape, and without any knowledge of its previous treatment. The dyspeptic symptoms and fever, so long complained of, should have raised suspicions of its real nature. The emetic, which was

Tinctura Amara.

R Aloës Socot. ℥j.
 Gum Mastiches,
 — Myrrhæ,
 — Benzoës, āā ℥viij.
 Radicis Gentianæ Concis.
 — Calumbæ Con.
 — Croci Angelic. Con. āā ℥jv.
 Spirit. Vini Gallici (vulgò Brandy), ℥xxxvj.
 — Bataviæ (vulgò Hollands), ℥xij.

Stet in digestionie diebus xl., deinde cola.

Haustus Rhei cum Ferro (pro Vermibus).

R Pulv. Rhei, gr. xij.
 — Zingiberis, gr. vj.
 Ferri Sulphatis, gr. ij.
 Infusi Gentianæ Comp. ℥jss. M.

Fiat Haustus, bis die sumendus.

Haustus Anodynus.

R Misturæ Camphoræ, ℥jss.
 Tincturæ Opii, ℥xxx.
 Spiritûs Ætheris Nitr.
 Vini Antimonii, āā ℥ss. M.

Haustus Camphoræ Compositus.

R Misturæ Camphoræ, ℥jss.
 Aquæ Ammoniacæ, ℥xx.
 Spiritûs Ætheris Nitr. ℥xxx. M.

evidently given with an idea that the sickness arose from the presence of bile in the stomach, was calculated to increase the evil. The two most important defects in the report of the case are, the neglect of ascertaining the existence of pain of the stomach upon pressure, and of mentioning the appearance of the stools. The grumous and dark fluid thrown up by vomiting is distinctive of the nature and stage of inflammation of the mucous coat of the stomach. It does not appear from the report, whether or no the internal surface of the small and large intestines was examined throughout. Such

Enema Anodynum.

℞ Mucilag. Seminum Lini, ℥ij.
Tincturæ Opii, ℥lx.
Olei Olivæ, ℥ij. M.

Lotio Nitro-Muriatica.

℞ Acidi Nitrosi,
—— Muriatici, āā ʒss.
Aquæ Puræ, ℥xxij. M.

Pilulæ Aloëtica cum Calomel.

℞ Hydrarg. Submur. ʒss.
Pulveris Antimonialis, ʒj.
Pilulæ Aloës cum Colocynth. ʒj.
Syrup. Simp. q. s. M.

Divide in Pilulas xx.

Pilulæ Hydrargyri cum Calomel.

℞ Pilulæ Hydrargyri, ʒj.
Hydrarg. Submur. ʒj. M.

Divide in Pilulas xx.

Pilulæ Hydrargyri cum Aloë.

℞ Pilulæ Hydrargyri, ʒj.
Aloës Socot. in pulv. ʒss.
Syrup. Simp. q. s. M.

Pilulæ Hydrargyri cum Ipecacuanhâ.

℞ Pilulæ Hydrargyri, ʒj.
Pulveris Ipecacuanhæ, ʒij.
Opii Puri, ʒj.
Syrup. Simp. q. s. M.

Fiant Pilulæ xx.

inspection ought always to be carefully instituted, particularly in cases characterised by disorder of the intestinal functions.

The insidious and obscure manner in which inflammation of the mucous coat of the stomach advances towards fatal disorganization, is illustrated by the following as well as by the foregoing case.

CASE II.—*Inflammation of the Mucous Coat of the Stomach, terminating in Ulceration.—Dissection.*

DENNIS M'CARTHY, 1st September, 1815, was attacked, after a short course of the blue-pill, prescribed for syphilis, with fever and great irritability of the stomach,

Pilulæ Hydrargyri cum Calomel. et Antimon.

R Pilulæ Hydrargyri, ʒj.
Hydrarg. Submur. ʒj.
Pulveris Antimonialis, gr. x.
Syrup. Simp. q. s. M.

Fiant Pilulæ xx.

Pilulæ Hydrargyri cum Calomel. et Ipecacuan.

R Pilulæ Hydrargyri, ʒj.
Pulv. Ipecacuanhæ, ʒss.
Hydrarg. Submur. ʒj.
Pulv. Antimonialis, gr. x.
Syrup. Simp. q. s. M.

Fiant Pilulæ xxiv.

Pulvis Calumbæ Compos.

R Pulv. Calumbæ, gr. x.
—— Rhei,
—— Zingiberis, āā gr. vj. M.

Pulvis Basilicus.

R Pulv. Scammoniæ, ʒss.
Hydrargyri Submuriatis,
Sacchari Albi, āā ʒij. M.

Pulvis Purgans.

R Pulveris Jalapii,
Potassæ Supertart. āā ʒss. M.

which rejected every thing he took as medicine or food. A blister was applied to the pit of the stomach, purgative enemas administered, and saline and effervescent mixtures, with the tincture of opium, prescribed. At present there is little or no fever.

2d.—Symptoms as above; no pain at the stomach or region of the liver.—Enema ex decocti cinchonæ, ℥v., et tincturæ opii, ʒj.

3d.—The fever has assumed the tertian type; is much exhausted.—An opiate plaster was laid on the stomach, and the enema continued.

6th.—The symptoms and treatment have undergone no change since the 3d; no advantage has been experienced from the plaster; no pain at the stomach or hypochondriac regions, and yet the vomiting continues. Had an attack of fever this morning, which was succeeded by cold sweats, hiccup, and vomiting. No rest last night.—Contin. medicamenta.

7th.—Had an opiate draught last night, which, with every thing else he took, was rejected. Hiccup this morning; cold sweats; pulse very frequent and small.

*Evening.**—Trembling; debility extreme; cold clammy sweats; hiccup and vomiting constant; countenance sunk.

8th.—Died in the night.

Dissection.—All the abdominal viscera were sound, except the stomach. The villous coat of this viscus was in several places covered with small superficial ulcerations, discharging a thin sanious fluid, particularly towards the cardiac orifice. All the coats of the stomach were much thinner and less firm than natural. The liver was sound.

Remarks.—This case was treated in the regimental hospital by the assistant-surgeon whilst we were on duty elsewhere. The absence of pain evidently deceived him as to the nature of the case. We have already remarked, that when the mucous coat of the stomach is affected with inflammation, pain is by no means uniformly present; sometimes, however, it may be detected by firm pressure, the patient taking a full inspiration at the time. Leeches ought to have been applied in this case to the epigastric region, and repeated according to the effects produced, during the first days of vomiting and fever being present, although the ultimate result might not have been different.

Acute Gastritis generally supervenes in a manner more or less marked. It occasionally commences with chills or rigors; but this depends in some

* The *morning* visit to the patients was always made from half-past five till half-past seven o'clock; and the medicines were generally given as soon as prescribed, and often under our own eye. The *evening* visit was made from five till half-past six or seven o'clock.

measure upon the cause which produces it. When it arises from the irritating operation of acrid or stimulating ingesta, there is seldom or ever any marked rigors, or even chills, although the extremities are often cold. There are generally dryness of the mouth, fauces, and tongue, great thirst, and a burning sensation, accompanied with great pain and anxiety at the pit of the stomach, præcordia, and hypochondria. The pain is attended with great tenderness at the epigastrium, dread of pressure in that situation, and nausea and vomiting, particularly after substances have been received into the stomach. Upon retching, the pain is often most acute, giving the sensation of something cutting or tearing the organ; and the perspirations, which are generally partial and cold, then become warm and profuse. The pulse is generally much accelerated, and of variable fulness and strength: sometimes it is full; at other times it is small and contracted; and it is occasionally both one and the other at different periods of the disease, according to the habit and strength of the individual, and the depletions which have been employed. Felt at the wrist, the pulse is generally weak, easily compressed, and occasionally scarcely to be felt, unless when the peritoneal coat of the organ is the tissue chiefly affected, when it is hard, or small and contracted. The acuteness of the pain, as well as the hardness and constriction of the pulse, seem to indicate the extent to which the more external coats of the viscus are affected; the less marked description of pain, or the dull and gnawing pain sometimes complained of, existing in connexion with nausea, vomiting, and anxiety at the epigastrium, and with a full, soft, or weak pulse, indicating the mucous and cellular coats to be the principal seat of disease. In the acute form of the malady, and after it has been fully formed and developed, the temperature of the trunk of the body is generally greater than natural, whilst the warmth of the extremities is either inconsiderable or below the natural standard. Attending these symptoms there are generally cramps of the abdominal muscles, and occasionally of the thighs and legs; sometimes also there are great weakness and pain of the lower extremities, with faintings; a cold, clammy countenance, cold perspirations, and almost total suspension of the secretion of urine, which becomes more abundant as the malady declines in severity.

As the disease advances towards an unfavourable termination, hiccup supervenes, with coldness of the extremities, a constant pumping up of the contents

of the viscus, frequent leipothymia, or faintings, especially upon attempting to sit up, great depression of the powers of life, cold surface, with a cold, clammy perspiration, painful spasms of the abdominal muscles, great increase of anxiety at the epigastrium, frequent sighing, a hurried and painful respiration, and extreme restlessness. If gangrene supervene, the pain and burning cease somewhat suddenly; but the face becomes colder and more collapsed; the surface colder, and covered with a more copious and clammy perspiration; and a manifest sinking of the powers of life is evident. The state of the bowels in acute gastritis is sometimes variable; but most frequently they are costive; and stools can generally be procured by the means of active glysters only.

When this disease terminates fatally, death has been very generally ascribed to the inflammation having run on to gangrene: but we believe that this termination is not so frequent as is supposed; for in several cases of acute inflammation of the stomach which have ended unfavourably, and which we have examined, complete gangrene of any portion of the viscus did not exist. In some cases it seems to us, that ecchymoses under the mucous coat of the organ, which is very often found in large patches, with softening of the inflamed tissues, have been mistaken for sphacelation and gangrene by those not much conversant in *post mortem* examinations. As far as our own experience goes, the extension of inflammation to the whole or greater part of the organ has been the chief apparent cause of death; general inflammation of this viscus appearing to be incompatible with the continuance of life. Indeed, death seems to supervene before the inflammation has reached that particular termination; and in many cases where mortification has been observed upon dissection, we are much disposed to consider it as having supervened after death, and to have been met with in consequence of the length of time which had elapsed between the period of dissolution and that at which the inspection of the body had been performed. In those cases which are inspected in hot countries, generally within a very few hours after their death, the exact state of the diseased parts is more likely to be seen than in those which, dying in cold or temperate climates, are seldom examined until upwards of twenty-four hours, or even thirty hours, after dissolution. The following case, besides other points of interest, presents

the usual appearance of the stomach after death of acute gastritis in warm climates, when examined soon after life is extinct.

CASE III.—*Acute Gastritis. Treatment not sufficiently active.—Dissection.*

MICHAEL CONNELLY, æt. 25, admitted the 25th May, 1816, with urgent pain and sickness of stomach, cold extremities, and cramps of the abdominal muscles and thighs. Bowels costive. Had a draught upon his admission, consisting of aquæ ammoniæ and tinct. opii, ℥ss. of each, in water. This morning, the 27th, he feels somewhat better: the pain is increased on pressure. He ascribes his illness to having eaten cocoa-nut.—Olei ricini, ℥jss.; the warm bath; and a blister on the stomach. Tamarind drink.

Evening.—He felt more comfortable after the bath; the extremities still remain cold, and almost no pulse at the wrist. After having taken a cordial draught and four or six ounces of wine, his hands and feet became warmer; pulse weak, and 89 in a minute; the stools from the medicine mucous and watery, but voided without pain or griping; the stomach and right side less painful since the application of the blister; no vomiting at present; skin cold and clammy; tongue white; much thirst.—Mist. salina, cum spirit. æther. nit. et aquæ ammoniæ. Calomel. gr. x.: et enema emolliens, h. s. Foment the abdomen.

28th.—Had some sleep; blister runs well; he still feels weak, and complains of a sense of weight about the præcordia; pulse about 100, and weak; skin cool and clammy; spasms continue over the abdomen and lower limbs, but are not so violent as yesterday; passed a fluid stool; tongue white.—Contin. mist. salin. cum spirit. æther. nit. et aq. ammoniæ. Capiat tinct. rhei, ℥ij. Foment the abdomen and lower limbs. Enema emolliens.

Evening.—Complains of sharp pain and burning at the pit of the stomach; vomited much green fluid to-day, mixed with a whitish substance. In other respects he feels better this evening. Skin warmer; bowels open; green stools; tongue moist; no headach.—Apply leeches to the pit of stomach; continue the saline mixture; and repeat the emollient enema. Tamarind drink.

29th.—Was relieved by the leeches; still complains much of the pit of the stomach; vomited green fluid; bowels open; pulse 89; skin more warm; tongue clammy; little sleep in the night.—Apply another blister to the scrob. cordis. R Tinct. opii, ʒxl.; aq. menth. pip. ℥j. ft. haustus. Enema purgans. Mist. salin.

Evening. — Found relief when the blister rose; still he complains much of the pain at the stomach; vomited a little; pulse frequent; skin more warm; tongue loaded; great nausea; stools clayey. — *Haustus emeticus ad vomitum.* Calomel. gr. x. h. s. Cont. mist. sal.

30th. — Vomited a great quantity of thin fluid; stools are feculent; complains of weight and uneasiness about the region of the stomach; pulse frequent; tongue yellow; skin hot; great thirst; still sickness at stomach. — Apply fourteen leeches. *Haustus effervescens bis in die, cum tincturæ opii, mxx.* *Mistura salina.* *Enema purgans.*

Evening. — Not much relieved by the leeches; the draughts allayed the vomiting; there appears more fever than ever; face flushed, with vertigo; tongue brown; sense of weight about the epigastric region; stools green; pulse 90, and fuller. — Apply twenty leeches to the regions of the stomach and liver. Calomel. gr. xij. *Mist. salina.*

31st. — The oppression at the epigastrium somewhat relieved by the leeches; still complains of great heaviness at the epigastric and hypochondriac regions; no sleep; no headach; no vomiting at present; bowels open; pulse 89; skin still clammy, and moist hands; feet colder than natural; feels no internal throbbing; tongue moist. — *Pilul. purgan. iij. pro dosi.* Contin. mist. salin.

Died at 12 P.M.

Dissection. — On removing the parietes of the abdomen, the following were the general appearances: — *Liver* protruding into the abdominal cavity, with its margin in contact with the arch of the colon; in consequence of which position, the stomach was concealed from view. The surface of the colon and small intestines (which last exhibited slight marks of inflammation) was covered by a sound omentum, in the folds of which was contained a considerable quantity of fat. On examination of the liver, which was very much increased in size, no vestige of recent inflammation was discovered, nor unnatural adhesions; but on its convex surface, in the right lobe, a large cicatrix was observed, around which the substance of the liver was of a pale yellow colour. Except this, there was no alteration of the organization of the liver; but, from its increased bulk, it must have considerably diminished the capacity of the right side of the thorax.

The *stomach* was found contracted and drawn up close to the diaphragm. It had undergone considerable changes. Its coats were much thickened, particularly near the pylorus, where its diameter was considerably diminished. Externally, no mark of inflammation was observable; but upon looking at the internal coat, there appeared

considerable inflammation over the whole surface, with a great degree of injection of the vessels, and corrugation of the internal coat.

The *colon* was unaltered in structure; but nearly the whole transverse arch, the descending portion and sigmoid flexure, as far as the rectum, were greatly contracted, apparently from spasm of the circular fibres forming the chief part of the muscular coat of this intestine. This narrowing of the canal of the colon, which was particularly remarkable in the transverse arch and sigmoid flexure, is shewn in one of the engravings illustrating the diseases of the colon, which will be treated of in the second volume of this work. The gall-bladder was empty. The other viscera were perfectly healthy.

Remarks.—This case was treated by the assistant-surgeon of the regiment, during our absence on staff duty. It does not appear, from the report, what number of leeches was applied on the second day of the treatment; but both general bleeding and the application of leeches were obviously indicated by the obstinate pain and burning felt at the stomach, and the frequent vomiting. Young practitioners are often deceived by the weakness of the pulse and signs of debility in inflammations of the stomach, — symptoms which can only disappear in this disease from active depletion, and from judicious means of cure applied to the surface of the body: in such cases the pulse generally rises after bleeding, as, indeed, it did in the present case, although the depletion was prescribed too late to be of service. The exhibition of the emetic was only admissible at the time when he ascribed his illness to the cocoa-nut which he had eaten; and then, either an ipecacuanha or a sulphate of zinc emetic might have proved advantageous: on the third day of the treatment it was too late.

Amongst the most frequent *causes* of gastritis in warm climates, are, the neglected or improper treatment of indigestion, the use of stimulating and irritating food, of spirituous and intoxicating liquors, and, amongst sailors, of salt provisions, conjoined with the abuse of spirits. Drinking cold fluids when the body is over-heated, is a very frequent cause amongst soldiers, especially in India, when on duty or on a march. The whole class of acrid and corrosive medicines and poisons, when received into the stomach in too large quantity, produces inflammation of the stomach, and destroys life by acting in this way only. Indeed, whatever, by its properties, over-excites, irritates, or otherwise injures the stomach, when received into it, is productive of in-

flammation of this viscus, to an extent proportionate to the degree in which it possesses these properties.

Too much animal food, and highly spiced and seasoned viands, violent fits of passion, the regurgitation of acrid bile into the stomach, the sudden application of cold to the surface of the body when over-heated, injuries received on the region of the stomach, the acrid and rancid combinations formed in the viscus during severe fits of indigestion, excess of food, causing over-distension of the organ, and the excessive indulgence in the intertropical fruits, more particularly in such as are digested with difficulty, — are all occasionally exciting causes of this formidable disease.

The causes which have been already adduced as productive of indigestion are also those which most frequently predispose to, and excite inflammation of the stomach, and especially that form of it which has its seat more exclusively in the mucous coat of the viscus. Irregularities in living, as respects both the quantity and quality of the food, and still more particularly drunkenness, are, with exposure to night-dews and to wet, the most common causes of both varieties of the disease amongst soldiers and sailors in warm climates. Drunkenness seldom occurs, particularly in those not habituated to it, without causing some degree of inflammatory action of the stomach, especially of its villous coat; and this is generally accompanied with determination of blood to, and inflammatory irritation of the brain, — the disorder of the one organ, thus induced, predominating over that of the other, according to the state of predisposition to disease existing at the time of exposure to the exciting cause. In many, also, in addition to vascular disorder of the stomach and brain, drunkenness induces disease of the liver and bowels; and although the inflammatory state of the stomach is the first derangement caused by the undue ingestion of spirituous liquors, the disorders occasioned in other viscera tend, in many cases, to remove that of the stomach, or to mask its existence; so that, although by no means an uncommon, it is not so frequent a cause of gastritis in its uncomplicated form as may have been supposed, from the prevalence of the practice amongst soldiers. Most commonly, when the disease is induced by this cause, it is complicated with disease of the liver and

bowels, the latter disorder being the more frequent consequence of this most baneful habit. It also, as we have already stated, proceeds from the extension of inflammation from the adjoining viscera, especially from the concave surface of the liver.

With respect to the *appearances* observed upon the dissection of those who have died of acute inflammation of the stomach, we may briefly state, that the vessels which run more externally in the stomach, and supply its peritoneal covering, are generally engorged with blood, and the capillaries injected: the omentum is also more vascular than natural. The internal membrane of the viscus is usually flaccid, collected into deep folds, owing to the constriction of the muscular coats; sometimes ecchymosed, owing to the transudation of blood from the capillaries underneath; generally inflamed, and varying in colour from a bright red, or crimson, to a deep purple or dark purplish hue; the inflamed portions extending in the form of broad patches, or wide bands or zones. This surface is sometimes covered with a limpid and viscid mucus; at other times, with a yellowish or puriform and thick matter; occasionally, with a whitish, thick, or concrete and albuminous substance; and on some occasions, with a thin ichorous or sanious fluid. The mucous coat itself is generally tumefied or thickened, softer than natural, and easily detached from the adjacent tissue, more particularly in the seats of the ecchymoses or subjacent sanguineous infiltrations. Upon dividing the texture of the organ, the coats are altogether thicker than usual, and their capillaries more or less engorged with blood; and the whole substance of the viscus is of a darker colour, and sometimes of a violet or deep purple tinge. In some cases, the mucous surface is abraded in parts, and a blackish grumous fluid is found in the cavity. Occasionally sphacelated spots or eschars are remarked; but these latter seem to be more frequently consequent upon death than the cause of it, unless in those cases of gastritis which arise from poisoning by acrid and corrosive substances.

When the peritoneal coat of the stomach has been chiefly affected, and when the disease has arisen from the extension of inflammation from the liver or spleen, then coagulable lymph is frequently found upon the external

surface of the viscus, causing adhesions, or a gluing of it to the adjoining parts, particularly to the concave surface of the liver, to the spleen, and transverse arch of the colon. In some cases of acute gastritis, the spleen has been observed congested with blood, and softer and more friable than natural.

The diagnosis of inflammations of the stomach shall not here detain us, as this subject, together with the complications they more frequently present in practice, will engage our attention in our observations on those diseases which are about to be considered. It may, however, be stated, with respect to the diagnosis between inflammation of the mucous coat of the stomach and indigestion, that there are very few symptoms, when taken singly, which can be relied upon as marking the absence or presence of the former disease. When, with the usual symptoms of indigestion, we find tenderness upon pressure at the epigastric region present in any degree, with slight fever, and more especially if there be sickness or nausea, a sense of heat at the pit of the stomach, occasional vomiting, and a white or loaded tongue, with red edges or point, and thirst, we should then consider inflammation of the mucous surface of the stomach as actually present, and act accordingly.

The following case will shew the difficulty of diagnosis between the most acute and dangerous forms of gastritis and the worst cases of cholera. It occurred before the epidemic cholera had made its appearance. The difficulty of recognising the exact nature of the case might not have been so great had the various phenomena connected with the malady been more particularly inquired into. We give it exactly as it stands in the journals of the hospital, and as such it is most instructive. The diagnosis between cholera and acute gastritis will be considered hereafter.

CASE IV.—*Most Acute Gastritis mistaken for Cholera.—Dissection.*

JAMES RATCHFORD, Artillery, admitted 21st December, 1816, at Kurnool, at nine o'clock in the evening, with violent retching and vomiting. He threw up nothing but a watery fluid, and sometimes, after great straining, a small quantity of bile.

Pulse hardly perceptible; skin cool; extremities cold; eyes sunk; frequent desire to purge, but passed nothing but water.—R Subm. hydrarg. gr. xx.; opii, gr. ij.; conf. aromat. q. s. ft. pilulæ duæ, statim sumendæ. Misturæ camphoræ, lbj.; aquæ ammon. ʒij. M. Half an ounce every hour. Warm applications to his stomach and limbs, and two men to shampoo him. This was continued during the night.

22d.—Still vomits, and his stools are of a milky appearance; pulse not to be felt; extremities cold; eyes sunk, &c. &c.—Repetentur calomelas, gr. xx.; cum opii, gr. ij. statim. Mulled Madeira. Apply a blister to his stomach. Effervescent draughts every half hour, with twenty drops of liq. ammon. in each dose. Fill bottles with warm water, and let them be applied to his extremities and belly; and continue shampooing.

Twelve o'Clock.—No material change.—Repetentur pilulæ subm. hydrarg. et opii, ut antea. Hot punch every quarter of an hour. Injiciatur enema anodynum. Rub his extremities with warm arrack, and put warm bottles to his feet. Add to the saline draught ℥x. liq. ammon. and sp. lavandulæ, ʒj.

Four o'Clock.—Vomits every thing he takes; has not passed any thing like bile in his stools. No pulse; arms and hands cold; legs warm.—Repeat the pills and draught; also the frictions. Administer the purging enema. Put him in the warm bath. Continue the warm applications and shampooing.

Seven o'Clock.—Repeat the purging enema to-night. Rept. haustus salinus, et adde tinct. opii, ℥xxx. Rept. pil. calomelas, et opii, ut antea.

23d.—Has slept at times during the night: but the vomiting has returned again this morning. His tongue is very foul and yellow; no pulse; eyes sunk; skin warmer than it was; feels fulness and soreness over him. Cramps not so frequent; but he is evidently in the greatest danger. The blister has risen well. The enemas have returned without producing any effect.—R Tinct. rhei, ʒj.; aquæ puræ, ʒss. M. ft. haust. Enema purgans to be repeated every three hours. Thick congee water warmed with some chillys to drink.

One o'Clock.—Rept. pil. calomelas, gr. xx.; opii, gr. ij. Repetitur purgans enema statim; etiam haust. cum tinct. rhei, ut antea. Warm wine to be continued, with the congee water and chillys. Has had copious evacuations, with black gelatinous matter mixed in them. The enema and tepid drinks to be continued.

Evening.—Has been full and copiously purged. Stools dark-coloured, with some white opaque mucus floating on the surface; has been vomiting a little, and has thrown up some green bile. Pulse not perceptible; skin cold, but not that unpleasant dew upon it. Gripped a good deal; no cramp.—Ol. ricini, ʒij. Congee water with

chillys continued, and the wine. The enema as before.—R Subm. hydrarg. ℥j. ; extr. cathartic. gr. x. ; syr. q. s. ft. pil. no. vj. ; one to be taken every hour.

Ten o'Clock, P. M.—R Tinct. opii, ℥xl. ; aquæ ammon. ℥xxx. ; sp. lavand. c. ʒij. ; aquæ puræ, ʒjss. M. ft. haust.

24th.—The stools which he has passed in the night are bilious, with green tenacious matter, and the appearance of some blood. Could not keep any thing upon his stomach all night. Pulse not perceptible, but his extremities are not so cold as they were. He feels anxious for something to eat. Arrow-root, with a small quantity of brandy, given.

Half-past Eleven o'Clock.—Has vomited up a great quantity of pure thick yellow bile, and was relieved by it. Feels inclined to vomit, but cannot bring up more.—R Pulv. ipecac. gr. xv. To be washed well off with warm water.

Four o'Clock.—Has thrown up an amazing quantity of bile. Very much exhausted. Had a fit a short time since. Skin cold ; pulse not perceptible ; breathes with difficulty, and cannot see.—Warm mulled port wine, and the wine as before. Opii puri, gr. ij. statim.

Died about seven o'clock.

Sectio Cadaveris.—The stomach much inflated, filling the whole epigastric region, and presenting a considerable degree of inflammation in the external coat, which was much thicker than natural. The vessels of the omentum full of blood, but not otherwise diseased : it covered the whole of the small intestines. The small intestines of a much darker colour than usual, much thickened in their coats, greatly inflated, no appearance of inflammation, but some evidence of venous congestion. The ilium of a purple colour, as usual in these cases. The cæcum much smaller, with purple spots over it, and the whole colon and rectum unusually contracted throughout their course. The circumference of the arch of the colon was found, upon admeasurement, to be two inches and a quarter ; the ascending part of the colon, two inches and five-eighths ; the sigmoid flexure, two inches and a quarter ; the descending colon, three inches and an eighth ; and the rectum, an inch and three quarters. The head of the colon, immediately above the cæcum, and the jejunum, were four inches and five-eighths. The right auricle was full of blood. The heart presented no other particular appearance. Lungs natural ; liver of a darker colour than usual ; gall-bladder not unusually full of bile.

On laying open the stomach, some inflamed spots were observed at the cardiac orifice ; but the lower part of the stomach and pylorus were in a high state of inflammation, and of a bright red and mottled colour. The part which was not

inflamed had the appearance of being covered with pus. The pylorus and head of the duodenum were also inflamed and mottled, and covered with green mucus; and the inflammation extended through the duodenum and the jejunum, where it stopped. The ductus communis choledochus was more open than we have ever seen it in dead subjects, and there was considerable inflammation about its orifice. The small intestines were full of hepatic bile, mixed with the secretions of the gut.

Remarks.—This is evidently a case of inflammation of the stomach, although it was mistaken for one of *mort de chien*, or that form of cholera which sometimes occurs in India, and which seems to be a similar disease with that which has been lately prevalent in India in an epidemic form. It was treated as a bad case of cholera; and is particularly instructive, as shewing the close resemblance which sometimes exists between it and acute gastritis. The absence of pulse, cold extremities, retchings, cramps, and watery motions, with deficiency of bile, are symptoms which are present in the worst cases of both diseases; and under circumstances like those in which the present case occurred,—in a crowded hospital, and during the performance of most extensive and laborious duties, with scarcely any effective assistance, and frequently insufficiently supplied with the necessary means of treatment,—the exact nature of the disease might have readily escaped the recognition of the most zealous and experienced physician. The exhibition of the emetic was suggested by the relief afforded by the vomiting, which had taken place shortly before it was prescribed. It evidently, however, did harm. Perhaps copious draughts of hot water might have been more beneficial.

SECTION II.

Of the Treatment of Inflammations of the Stomach.

THE treatment of inflammations attacking this important organ must be strictly antiphlogistic, and proportionate to their acuteness. In the chronic form of the disease, or that seated in the mucous coat, the same means as those which acute gastritis requires are equally necessary, but to a less extent. In the majority of cases, we have found the application of from twenty to forty

leeches to the hypochondria and pit of the stomach, followed by a large dose of calomel and opium, and a large blister on the epigastric region, at once arrest the disease. The exhibition of a large dose of calomel immediately after depletion is particularly indicated in this complaint. In the experiments which we performed with this medicine,* in order to ascertain its mode of operation, we satisfactorily shewed that it acts most decidedly in diminishing vascular action in the stomach. When we give it, therefore, in combination with opium, after depletions have been prescribed, and at the time that counter-irritation is being performed, we resort to the most powerful means in our power of arresting the disease, and of correcting the state of the secretions poured into the intestinal canal. In addition to the above remedies, purgative glysters ought to be exhibited from time to time, until the stomach can bear, without inconvenience, the presence of purgative or aperient remedies. These means should be repeated until the symptoms of the disease disappear, and should be resumed whenever the disorder returns, after having been subdued for a time.

When the disease assumes the acute form, and presents the symptoms we have detailed as indicating this state, blood should be taken from the arm, and a number of leeches applied to the epigastric region, in a decided manner, in proportion to the habit of body and strength of the patient, and severity of the disease. After these means, twenty grains of calomel with three of opium ought to be immediately exhibited, in order to diminish the vascular action of the viscus, and to prevent the return of the increased circulation, after the operation of bleeding. After the bleeding by the leeches,† a large blister may be placed upon the region of the stomach, with a

* See the Sketches of the Diseases of India, p. 389.

† A number of leeches should be applied at once, sufficient to take away that quantity of blood which the physician wishes to remove; and the hæmorrhage from the bites ought immediately to be stopped, by means of the muriated tincture of iron, as soon as all the leeches have fallen off; for the bites of the Indian leeches are so deep and large, that the application of fomentations or poultices immediately afterwards, may be attended, in a short time, by fatal hæmorrhage. When the bites have ceased to bleed, then hot poultices may be employed, if they be frequently renewed, and closely watched.

view of transferring the increased vascular action from the interior to the surface of the body. The bleeding, both general and local, or the latter merely, ought to be repeated until the disease is subdued; and should be followed by the exhibition of the calomel and opium, and the external means mentioned above. The action of the bowels ought to be promoted by the injection of active cathartic enemata; and, as soon as the stomach can retain medicines, the saline mixture may be given, and full doses of calomel taken at bed-time.

When the inflammation arises from the ingestion of acrid, corrosive, and poisonous substances, the exhibition of an emetic may then be requisite; but in all such cases, the use of the stomach-pump, lately introduced into practice, seems to us more advisable,—and, under some circumstances, both may be resorted to with advantage. In many cases of inflammation of the stomach, an emetic has been prescribed, with the idea that the symptoms complained of by the patient were the result of acrid secretions disordering this viscus, and of vitiated bile regurgitated into it from the duodenum: but although the practice has been productive of no ill effects on many occasions, and has even in some instances done good, yet on others it has appeared to us to aggravate the disorder. The cases which are most frequently benefited by an emetic, are those arising from the ingestion of unripe or indigestible fruit and unwholesome food. For these, the emetic should be prescribed as early as possible, and should consist either of ipecacuanha or of sulphate of zinc, given in divided doses, at intervals of five minutes, until a full operation is produced.

In those slighter cases of inflammation of the stomach following inebriety, the saline mixture, the formula for which has already been given, or that made from the carbonate of ammonia and lime-juice, has generally been serviceable; and when this has not allayed the inflammatory irritation, the application of leeches, followed by a blister, has generally removed disorder. As soon as the disease is arrested, then strict attention ought to be paid to the state of the alvine secretions and excretions; and these should be promoted by the milder aperients and laxative enemata, until health is quite restored.

At first, whatever is given to the patient in the form of food or drink ought to be of the most bland description; and care should be taken, both by himself and the practitioner, that the stomach be not offended by the ingestion of too stimulating and heating food, or of substances of difficult digestion, until the functions of the organ be completely restored. Even the most light and mild food should be at first partaken of most sparingly, and be persevered in until recovery is complete. But even when this end is completely fulfilled, the patient ought ever to recollect, that he is the more liable to an attack of the disease from having once experienced it; and he should therefore be most cautious as to his diet and regimen on all occasions.

The following case shews that the acute form of the disease may be completely removed by the decided employment of local depletion alone. In weak and debilitated individuals, and in those who have long resided in warm climates, local depletion ought to be preferred, especially as the quantity of blood which may be removed by the leeches of India may be determined with the utmost accuracy.

CASE V.—*Gastritis readily yielding to local depletion.*

JAMES WOODTHORPE, ætat. 28, was admitted 11th July, 1816, complaining of great pain at his stomach, increased on pressure, and sickness, with cramps in the abdominal muscles. His stools are watery; tongue white, but moist; pulse small and frequent. An emetic had been administered on his admission; but we did not see him till the following day.

12th.—He vomited green bile last night, and is not so sick this morning; but he still complains of great pain in his stomach, and feels weak and faint. The pain is more acute, and his pulse fuller and stronger than when admitted. There are no pain or cramps in his limbs, and his stools are natural and formed. Apply twenty leeches to his stomach, and administer the purging enema.

Evening.—The pain is removed by the leeches, which bled well; no sickness or cramps; bowels open. Twelve grains of calomel at bed-time.

13th.—He feels much better this morning; no pain, or sickness, or abdominal cramps; stools greenish brown and bilious. To take the compound jalap powder.

Evening.—Continues better; stools dark and bilious. Twelve grains of calomel at bed-time, and purging powder in the morning.

From this period his stools continued to improve, and he rapidly recovered.

Remarks.—The inflammatory attack in this case seems to have been aggravated by the irruption of acrid and disordered bile into the stomach, consequent upon the exhibition of the emetic. The active and successful operation of the leeches, which bled to the extent of about twenty-six ounces, rendered all other means unnecessary, excepting those which were required for the purpose of carrying off the disordered bile.

The following case also illustrates the efficacy of decided local depletion, when employed early in the disease, and followed by suitable means of cure.

CASE VI.—*Gastritis after excesses removed by decided local depletion, and calomel and opium.*

WILLIAM BOYLE, admitted 28th May, 1817, with pain at the pit of the stomach, and constant vomiting, particularly after taking any thing into his stomach. Pulse quick and soft.—Apply thirty-six leeches to the epigastric region immediately; and afterwards give twenty grains of calomel and two grains of opium.

29th.—The leeches bled remarkably well; pulse now languid; the pain is nearly removed, and the ingesta are now retained on the stomach; the tongue still excited.—To take the purging mixture every two hours until his bowels are fully relieved.

Evening.—Much better; stools dark and bilious. Give him ten grains of calomel at night, and the bitter mixture in the morning.

30th.—Nearly well; no pain; stools natural.

Evening.—Discharged.

31st.—Has returned this morning with pain in the abdomen and purging; has been drinking during the previous night; tongue foul.—The purging powder immediately.

Evening.—Is much better this evening; stools copious and feculent, with viscid mucus.—Ten grains of calomel at bed-time, and the purging powder in the morning.

June 1st.—Tongue still foul, but no pain; is much better; stools offensive, but natural in other respects.—Twelve grains of calomel at night, and the purging powder in the morning.

2d.—He feels well this morning; tongue clean, and the stools are natural.—Repeat the purging powder.

3d.—Quite well. Discharged.

Remarks.—This was a case of gastritis arising from excesses. The beneficial operation of the leeches applied to the stomach, and which bled to upwards of forty ounces, was here most evident. The exhibition of the large dose of calomel and opium after the depletion, effectually prevented the return of inflammatory action. Such determined drunkards are many of the European troops in India, that the certain knowledge of even fatal consequences from the habit will not deter them from it. The very evening of his discharge from the hospital this man was drunk. The symptoms, on his return the following morning, were those of irritation of the mucous surface of the small intestines, which was readily removed by carrying off the disordered secretions, which were probably the cause of disorder.

Individuals of full habits, recently arrived in India, require often the most active depletions before the disease is arrested. The subjoined case is an instance to this effect.

CASE VII.—*Acute Gastritis, requiring most active depletions for its removal.*

THOMAS FARRAL, Recruit, H. C. (a robust young man), admitted 15th August, 1819, with great pain in the region of the stomach, and tenderness on pressure; sickness with vomiting, but no purging; pulse quick and small; skin warm; tongue loaded.—Apply twenty-five leeches to the stomach. Enema purgans. V. S. ad ℥xxiv . statim.

Evening.—Relieved by bleeding.—Calomel. gr. xx.; pulv. antimon. gr. iij.; opii, gr. ij.; syrup. q. s. ft. pil.

11 o'Clock, P. M.—Pain and vomiting returned.—Venesection ℥xvj . Apply sixteen leeches to the scrobiculus cordis.

16th.—Much better; pulse soft and good; skin moist; tongue dry and furred; thirst.—Mist. purgans. Mist. salin. feb. R Calomel. gr. x. h. s.

17th.—Pain in his stomach returned; pulse strong and full; has pain and giddiness in his head.—Mist. purgans. V. S. ad ℥xvj . Apply eighteen leeches between the scrobiculus cordis and umbilicus. Rept. Calomel. gr. x. horâ somni.

18th.—Much better; mouth sore; no pain of any kind.—Mist. purgans.

Vespere.—Giddiness in his head.—Apply ten leeches to the nape of the neck. Cont. mist. salin. ut antea.

19th.—Much better.—Pulv. purgans statim. Mist. salin.

Vespere.—Apply ten leeches to his head.

20th.—Head much better from the leeches; tongue foul; mouth sore.—Pulv. purgans statim. Flannel round his neck.

21st.—Head well.—Cont. mist. salin.

Vespere.—Feels much better; mouth sore; no stools since yesterday.—R Mist. amar. cum sennæ, \bar{z} ijj.; magnes. vit. \bar{z} ij. M. statim sumenda.

22d.—Gargle. Cont. ut antea. Pulv. purgans.

23d.—Cont. haust. amar. ut antea.

24th.—Cont. garg. et haust. purgans.

Vespere.—Discharged.

Remarks.—This was a case of primary and uncomplicated acute inflammation of the stomach, occurring after the excesses of eating and drinking to which recruits are liable on their arrival in India. The dose of calomel, antimony, and opium, was given with a view of preventing the return of the vascular action after the depletion instituted on his admission, and which, including the loss of blood from the arm and locally by leeches, amounted at once to about fifty-four ounces. The local bleeding was commenced as soon as the arm was tied up. Notwithstanding the decided employment of the above means, it will be perceived from the report, that when we visited the patient at eleven, P. M., the inflammatory symptoms had returned, and that sixteen ounces of blood were then taken from the arm, and about eighteen* from the region of the stomach, making altogether thirty-four ounces at that time; and within twelve hours, he lost altogether about eighty-eight ounces. The depletions prescribed on the 17th and 18th were also to a considerable extent. The affection of the mouth arose from the calomel contained in the first dose, and from that given subsequently as a purgative, owing to the readiness with which this medicine affects the mouth after large depletions. The practice of giving large doses of calomel with opium, and James's powder, after full depletions, in order to arrest inflammatory diseases of any of the organs concerned in the digestive process, has generally been followed with considerable benefit.

It is not our intention to offer at this place any observations on the treatment of those cases which are complicated with diseases commencing in the other abdominal viscera, or of those which supervene in the course of idiopathic fever, as such complications will be more appropriately considered

* The quantity of blood taken by the leeches is calculated according to the results of the numerous observations made by us in order to ascertain this point with precision.

when these disorders, in which the disease of the stomach originates, come to be treated of. The two following cases, however, although complicated with disorder of the biliary organs, are instances of the supervention of acute gastritis, independently of the hepatic disease, and therefore may be considered as cases of the idiopathic form of the malady under consideration, presenting additional points of interest. Although hepatic disorder was present in a slight degree before the supervention of gastritis, and during its course, this latter may nevertheless be considered, as respects these cases, as an independent and primary disease, and by no means originating in the hepatic disorder. These cases also shew how much more alarming the symptoms of gastritis are, when present in an acute form, than those of hepatitis. The first of the two, also, is farther interesting, as furnishing an example of the supervention of the acute form of hepatitis upon the removal of acute inflammation of the stomach.

CASE VIII.—*Gastritis complicated with Chronic Hepatitis, Acute Hepatitis supervening upon the removal of the Gastritis.*

GEORGE COWAN, ætat. 21, admitted 12th July, 1816, 8 o'clock, P.M. Has been drinking, and was seized yesterday morning with vomiting, which has continued ever since. Although he has not complained till now, has sharp pain in the pit of the stomach, and some hardness is felt upon pressure. Pulse frequent and small. Great thirst, and heat at stomach.—A blister was applied to the epigastric region. Twelve grains of calomel were given, and an ounce of tincture of rhubarb soon afterwards. Tamarind water for drink.

13th.—Saw him for the first time. Vomits every thing he takes; pain increased upon pressure; pulse small and fluttering; no stool.—Apply eighteen leeches over the region of the stomach. Enema purgans statim. R Mist. salin. febrif. ℥j.; aquæ ammoniæ, ʒij.; spirit. æther. nit. ʒij.; tinct. opii, m100. M. fiat mist. Take a wine-glassful every hour.

Evening.—The sickness continues. Has had two stools. Pulse frequent.—Continue the mixture, and give the following pills immediately: R Calomel. gr. xij.; opii puri, gr. iij.; syrup. q. s. m.

14th.—Pain abated, but still vomits: tongue clean. Had one stool in the night.—Contin. mistura. Enema purgans.

Evening.—Still vomits.—R Opii puri gr. iij.; ammon. carbon. gr. jv.; confect. arom. q. s. fiant pilulæ ij. statim sumendæ, et horâ somni repetendæ.

15th.—Was not so frequently vomited during the night. Feels better this morning. Had three or four small stools.—Rep. pilulæ. Tinc. rhei, ʒj. at noon.

Evening.—Much better. Has been purged. Pulse good.—Calomel. gr. xij. statim. Rep. pilulæ cum opio, horâ somni.

16th.—The vomiting has ceased. Had a watery stool in the night. Complains of an obtuse pain under the right and left ribs. Pulse frequent; skin cool.—Apply ten leeches to his right side; and rub in ʒj. unguent. mercur. upon the hypochondria, night and morning.

Evening.—Has not been sick.—R Calom. gr. xij.; opii, gr. ij.; syr. q. s. fiant pilulæ ij. h. s. s.

17th.—No vomiting. Feels easier. Pulse 74, and of good strength; tongue clean.—Pulv. purg. ex aquæ menth. pip. ʒij.

Evening.—Has been purged; was not sick; pain in his right side the same.—Calomel. gr. xij. Inung. ʒj. ung. mercur. n. et m.

18th.—Some return of the sickness at stomach. The pain in his side is severe. Belly full, but not tense.—Mist. purgantis, ʒj. every two hours until it operates. The purging enema.

Evening.—Has been fully purged this day, and the sickness at his stomach is better; but the pain in his side is very acute. He complains of a fainting sensation on pressure, and there is some fulness near the umbilical region, but none in the region of the liver. Has had rigors and cold perspirations. (I fear there is an abscess forming in the liver, if it be not already formed.)—Calomel. gr. xij. Continue the mercurial friction. Apply a blister to the epigastric region.

19th.—Says that he had cold sweats and shivering in the night; tongue clean and moist. Pain of right side still continues, and his belly feels full, but not tense. Pulse tolerably good. His mouth affected; but there is no ptyalism.—Contin. frictio mercur. Mist. purg. ʒj. statim.

Evening.—Pulse quick; skin warm; fully purged; stools clay colour, and of a thick consistence.—Calomel. gr. xij. Mist. salin. febrif.

20th.—Feels somewhat better. Passed green and offensive stools in the night. No sickness; no ptyalism. Mouth swollen.—Mist. purg. ʒj. stat. Rep. mist. salin. Contin. frictio.

Evening.—Is easier; ptyalism; green feculent stools.—Calomel. gr. xij. Contin. mist. sal.

21st. — Mouth very sore, and ptyalism considerable; pain somewhat easier; pulse small, but good. Had one stool in the night, which is more feculent than before. — Contin. mist. salin. Rep. mist. purg. \bar{z} j. stat. Rub in only once a day.

Evening. — No material change. Has been purged. — Haustus amar. cum sennæ, \bar{z} ij. h. s.

22d. — Has an appetite; the pain is diminished; mouth very sore; ptyalism considerable; pulse quick. — Mist. purgan. \bar{z} ijj. Contin. alia. Some soup and fowl.

23d. — The pain in his side is easier, excepting when he moves. Pulse good. — Mist. purg. \bar{z} ijj. Contin. alia.

24th. — Pain less. Complains of distension and weight after eating. — Mist. amar. cum sennæ, \bar{z} ij. statim. Contin. mist. salin. Discontin. frictio. Capiat pilul. hydrarg. no. j. horâ somni.

25th. — Pain much better; mouth very sore, and ptyalism considerable; bowels regularly open. — Capiat mist. amar. cum sennâ stat.

26th and 27th. — Continued to improve. The purging mixture only was given, so as to keep up a regular action of the bowels.

28th. — A seton to be inserted in his side, over the liver. Continues to improve, and can bear pressure on the hypochondriac and epigastric regions.

His bowels were kept open from this time by means of the mistura amara cum sennâ, and an occasional dose of calomel or blue-pill at bed-time; and although he had several slighter relapses, during the two or three subsequent months, of the inflammation of the liver, most probably from irregularities, yet he recovered.

Remarks. — This was a case of inflammation of the stomach supervening to chronic hepatic disorder, and occurring in an habitual drunkard, although a young man. The heat of stomach complained of, ought to have pointed out to the sub-assistant in attendance the propriety of local depletion immediately upon his admission, according to the strength of the patient, who in this instance was much reduced by previous excesses and bad health. This symptom, particularly when accompanied with thirst, should, even more than the presence of pain, alarm the practitioner. The tincture of rhubarb was given by this assistant, for the purpose of allaying the irritability of the stomach, he considering it more the consequence of the previous debauch, than the accompaniment of inflammatory action. The leeches which were directed to the epigastric region, immediately upon our seeing the patient, bled to the extent of about twenty-six ounces; and although they failed of removing the sickness, they relieved the pain and burning sensation complained of. The large dose of calomel, with the three grains of opium, was given with a view of allaying the

irritability of the stomach, and preventing the return of inflammatory action. The enemata were prescribed with a view of removing accumulations in the bowels, and promoting the intestinal functions. The cardiacs and cordials afterwards administered were ordered on account of the habits and state of the patient.

The rigors, cold perspirations, and tumour at the epigastric region, complained of on the 18th, and which excited fears of the formation of an abscess, evidently arose from the excessive congestion of bile in the gall-bladder,—a circumstance of frequent occurrence in the course of hepatic diseases, and one which is not infrequently mistaken for abscess. The appearance of the motions on the following days was confirmatory of this opinion.

After the subsidence of the gastric inflammation, the hepatic disease assumed a more acute character. The treatment was then directed with the object of producing ptyalism as soon as possible, and at the same time keeping up a constant action of the bowels. These ends were accomplished; and, notwithstanding the very unfavourable circumstances of the patient, and untoward symptoms occurring during his treatment, he at last recovered. Soon after his recovery he returned to his old habits, and was afterwards several times in hospital, for attacks of acute hepatitis supervening to the chronic disorder of the biliary organs, from which he was never altogether free.

CASE IX.—*Gastritis complicated with Hepatitis: recovery protracted, owing to the neglect of more decided measures at its commencement.*

ROBERT BROWN, ætat. 19, admitted the evening of the 24th July, 1817, with pain at his stomach and general uneasiness. The pain is increased after swallowing, and whatever he takes is rejected by vomiting. He complains of a sensation as if something were cutting his stomach, immediately after having received any thing into it. Pulse good; bowels regular.—Calom. gr. xx.; opii, gr. ij. h. s. s.

25th.—Was purged in the night. He now complains of pain in his right side, about the third and fourth ribs, which, he says, strikes down to the scrobiculus cordis. Tongue clean; pulse small.—Apply a blister to his side and stomach. Pilul. hydrarg. gr. v. ter die. Capiat olei ricini, ℥ij. statim.

Evening.—Stools liquid and brown; feels no relief of the pain at his stomach, but the medicines are retained.—Calom. gr. x.; opii, gr. ijss. h. s. s. Cont. pilul. hydrarg.

26th.—Stools white and fluid, with lumps of fæces. Has no relief from the pain in his chest and stomach. Complains of difficulty of passing his urine. Pulse small,

and 78. — R Pilul. hyd. ʒj. ; opii, gr. vj. M. Fiat pilulæ xij. Capiat unam ter die. Haustus amar. cum sennæ, ʒj. ; tinct. ferri muriatis, ℥xij. bis die.

Evening. — No material change. — Pulv. Doveri, gr. xv. h. s.

27th. — Perspired in the night, and feels easier this morning. Pulse the same. — Contin. pilul. et haustus, ut antea.

Evening. — His mouth is a little sore. He feels his stomach easier. — Pulv. Doveri, gr. xv.

28th. — The pain he complains of after eating is not so severe. — Contin. omnia. Sago for breakfast.

29th. — His mouth is affected. The pains of his stomach and chest are abated. — Olei ricini, ʒj. statim. Contin. pilul. et haustus amar. ut antea.

Evening. — No material change. — Contin. pulv. Doveri h. s.

30th. — Pains diminished ; mouth sore ; bowels open. — Contin. haustus amar. cum tinct. fer. mur. Gargarisma.

31st. — Stools liquid and feculent ; stomach feels still a little painful. — Contin. haustus.

This was the last day the author prescribed for this case, he having been appointed superintendent-surgeon of the army, under his Excellency the Commander-in-Chief, Sir Thomas Hislop. The man was now evidently recovering, and indeed did recover, although the case was protracted.

Remarks. — This case is given more with a view to instruction, and to exemplify the complication of inflammation of the stomach with hepatic disorder, than to shew success of treatment. This patient should have been blooded, either generally or by leeches, on the second day of the report, in addition to the blister and the calomel and opium. But the state of the pulse, and the impression on our mind that the pain arose from the irritation of offending matter and acrid bile regurgitated into the stomach, led to the treatment employed. If bleeding had been premised, the symptoms would most probably have yielded much earlier. The mercurial remedies, in conjunction with full doses of opium, were given with a view of affecting the system as soon as possible, in order to subdue disordered action and secretion in the abdominal viscera. The tinct. ferri muriatis was given in consequence of the difficulty the patient experienced in passing his urine ; and we did not conceive that the stomach disorder contra-indicated its exhibition, the vomiting having ceased, and the pain having been diminished before it was prescribed.

SECTION III.

Cursory Remarks on some Organic Disorders of the Stomach, generally the result of Chronic Inflammation, and occasionally met with in Residents in Warm Climates, or in those who have resided in them.

ORGANIC diseases of the stomach, of a chronic description, are not less frequently met with in warm than in cold climates. Those changes which proceed from acute attacks of gastritis, and which have been already noticed, are also not infrequently present; but both description of lesions are more often observed as the concomitants of some other diseases, and consequent upon them, than occurring in a primary form. Vascular action generally assumes more or less of an acute character within the tropics; therefore the usual consequences of such action may more frequently be looked for upon dissection. Yet those organic changes which have been generally ascribed to the previous existence of slow inflammatory action are occasionally observed, and, during the life of the patient, have often been misunderstood, and consequently have not been treated by the appropriate means. In many instances these derangements of structure have supervened to indigestion of long standing, which has been neglected or improperly treated; but here, inflammatory action, in a slow form, must have intervened between the appearance of the dyspeptic symptoms and the supervention of organic disorder. In other cases, the organic disease seems to have succeeded to symptoms of indigestion, without any signs of inflammatory action being apparent, or, perhaps, existing. Indeed, although organic changes of this important organ are very generally the results of inflammatory action of an acute or chronic form, yet they are by no means uniformly or exclusively the consequence of such disorder. In some few cases, the change observed upon dissection indicates an opposite state of the vessels to that of inflammation, and seems to evince the previous existence of deficient vitality of the organ, and diminished vascular action. These disorders are seldom made evident to the practitioner during the life of the patient, by symptoms sufficiently, or at all, marking their nature; and it is only

by the presence of many of the usual signs of indigestion, together with loss of flesh, and a waxy appearance of the countenance, that he is led to infer the existence of chronic organic disease of the organ; but its precise nature is concealed from him until death supervenes, and he is allowed the opportunity of detecting it by the aid of the scalpel. Sometimes the appearance of the substances ejected by the stomach, when vomiting is a symptom, and the period after eating at which vomiting begins, will enable him to form some opinion as to the nature of the disorder; and even the report furnished by a rigid and careful examination of the hypochondriac and epigastric regions may farther establish the opinion thus formed: but yet, in the majority of cases, much uncertainty will exist as to its precise nature, although the particular organ diseased may be readily recognised.

In some few cases the stomach is found, upon dissection, very much dilated, and at the same time thinner in its parietes. This seems to have arisen from the extrication of gas in its cavity, which has merely distended it to an unusual degree. In a few instances, the stomach has been observed more than commonly large, and its coats, at the same time, flaccid and thickened, without any evident traces of recent inflammation; and this appearance has been more frequently met with in those who have been habitually addicted to excesses. Occasionally we have observed the stomach of its natural size, and its coats paler, thinner, and softer than natural. Sometimes this condition of the parietes of the organ has been conjoined with ulcerations in the mucous coat, and which, when closely examined, seemed to commence in the mucous follicles. Such ulcerations, although met with in all parts of the internal surface of the organ, were usually most numerous towards its pyloric and cardiac orifices. It seems doubtful to us, whether or no these appearances are actually the result of inflammatory action. We are more inclined to believe, that they neither necessarily, nor even generally, proceed from this cause. With respect, however, to ulcerations commencing in the mucous coat of the organ, we conceive them most frequently to arise from inflammatory action, although we cannot admit that they always originate in this manner. It seems not improbable, that obstructions taking place in the follicular glands, owing to deficient activity of their functions, are followed by vascular action,

terminating in ulceration; and that the disorder, which at first was functional and characterised by deficiency of vascular action, induced an opposite condition of the vessels, terminating in organic disease.

The softened state of the coats of the stomach, often observed upon dissection of those who have laboured under disorders of this organ, and who have died either of them or of some other diseases in which the complaint of the stomach was merely a concomitant, is more unequivocally, in the majority of cases, the result of inflammatory action, and is often accompanied with well-marked inflammatory appearances in some part or other of the organ. In some cases, however, no signs of inflammation have been present, either during the life of the patient, or upon dissection after death. How this state of the organ could have arisen, otherwise than from inflammatory action, it may, perhaps, be difficult to say, unless we impute it to deficient vitality and imperfect nutrition of the parietes of the viscus, existing for a considerable time before death.

When softening of the stomach is met with, attended with marks of inflammatory action, the coats are usually thickened, and the mucous coat pulpy, and easily detached from the adjoining textures. If the inflammatory action has been of an acute character, or approaching to it, the mucous tonic is soft in proportion, the more easily lacerated, and darker in colour. On the other hand, it is the more indurated and pale, the slower or more chronic the inflammatory action which had previously existed. When the internal surface only has been the seat of inflammatory disorder, then the softness and facility of laceration are limited to this situation; and in proportion as the disease has extended to the adjoining textures, do they present these particular changes. Conjoined with this condition, the mucous follicles have been frequently found enlarged, and unusually prominent.

Thickening of the coats of the stomach is not an infrequent appearance, and, with the foregoing lesions, has been often observed by us upon dissection of patients who had died of fevers, dysentery, and hepatitis; and this state has generally been found conjoined with either softening or hardening of the

tunics, and in some cases with ulcerations commencing in the mucous coat, in addition to these changes. When the thickening of the coats of the stomach is attended with some degree of induration, and with a deposition, in the cellular substance connecting them, of a substance varying in consistence from the white of egg to that of cheese, and presenting an albuminous appearance,—then the organic change is far advanced in its progress to scirrhus, is generally the result of long-continued inflammatory irritation of the vessels of the part, and usually is accompanied with increased development of the follicular glands in the vicinity of, or seated in, the part, which soon becomes ulcerated, and thus the fatal termination of the disorder is hastened. This change generally is met with about the pylorus and cardia, in many cases constricting the apertures, and converting them into hardened and thickened rings, the interior of which is beset with ulcerations of various sizes, and with softened points. This particular organic lesion is, perhaps, oftener observed in temperate than in warm climates; but this is owing to the circumstance of Europeans generally having returned to their native countries before the period of life at which this and some other chronic disorders of the stomach supervene, or at least before they terminate fatally, and thus admit of detection by means of the knife.

The mucous coat of the stomach often presents patches of various colours and shades, from a deep red to a violet, purple, brown, or slate colour; and these are frequently elevated above the surrounding parts. This seems to have depended upon increased vascularity of the capillaries of the part, and enlargement of their diameters. More frequently these patches are situated about that part of the viscus which is covered by the spleen: sometimes they are found in other parts, and are often observed in the dissections of those who have died of remittent fever. This change has been most frequently remarked in those who have vomited during life dark-brown or black grumous fluids. This appearance of the ejected matters seems to have proceeded from the exudation of blood from the capillaries of the patches now noticed, changed by its remora in the stomach, and by admixture with the various fluids and matters contained in it. When chronic inflammation of the mucous coat of the stomach has proceeded to ulceration, and when the internal surface of the scirrhus

indurations of the cardia and pylorus undergo such change, a similar appearance of the matters ejected from the stomach to that described above, is usually observed. Sometimes these matters present an inky colour, and at others a greenish-black hue. This is owing, perhaps, to the admixture of acrid and dark-coloured bile with the morbid matters flowing from the diseased surface, giving rise to a deeper colour of these fluids.

The foregoing organic changes embrace those which are most frequently met with in the stomach, independently of acute attacks of gastritis, either in warm climates, or amongst those who have resided in them. In the majority of cases, these lesions have most evidently proceeded from long-neglected dyspepsia, and from the protracted irritation of the mucous coat of the stomach, by the acid and acrid compounds formed in it. In many instances they may be imputed to the abuse of spirituous and other intoxicating liquors; in some, to the use of hot spices and curries; and in not a few, to the conjoined operation of all these causes.

SECTION IV.

Of the Treatment which may be adopted in the foregoing Organic Diseases of the Stomach.

ON this subject little can be advanced, as the majority of the lesions now described are seldom manifested by any very decisive symptoms, beyond those which characterise the more urgent cases of indigestion, until they have advanced beyond the reach of medicine. When, however, the more severe symptoms usually ascribed to dyspepsia are present, with occasional vomiting of an albuminous, ropy, and whitish substance, floating upon the surface of, or swimming in, the other matters ejected from the stomach, with pain at the epigastrium, and anxious expression of countenance,—then the practitioner should dread the existence of a chronic inflammatory state of the stomach,

with, perhaps, enlargement of the follicular glands; and he should be prepared to expect the supervention of ulceration, if this have not even then already taken place to some extent. In this state of matters, leeches ought to be applied to the region of the stomach, and repeated according to circumstances, followed by blisters; and mucilaginous and soothing medicines should be taken internally. Alterative doses of the milder preparations of mercury, with subcarbonate of soda, may be given from time to time, or continued night and morning; and cooling remedies, consisting of the nitrate of potash, or the acetate of ammonia, may be taken in soothing and mucilaginous vehicles. In all cases of this description, greater advantage will be obtained from living upon a mild, farinaceous, and mucilaginous diet, taken in small quantity, and perhaps often, and by avoiding the ingestion of any thing calculated to stimulate the stomach, or to generate acidity, than by medical treatment. The state of the bowels ought, however, to be attended to, and the operation of the above-mentioned gentle remedies promoted by the use of injections. The best internal remedies which can be taken are the hydrargyrum cum cretâ with soda, or the simple or compound ipecacuanha powder. These may be also conjoined with the extractum taraxaci, or the extract of hop, or with small quantities of the extractum conii or hyoscyami. In many cases, the different preparations of opium may be taken with advantage; and the extract of poppy, and similar preparations, may be resorted to when the symptoms are urgent. From all these we have experienced advantage; and in several instances, by using these means, and varying them according to circumstances, and by adopting and invariably pursuing a most rigidly abstemious and bland diet, the patients have recovered, when the usual signs of incipient ulceration were present.

In some cases, owing to the debilitated and sinking state of the patient, mild and mucilaginous tonics are requisite, and may therefore be prescribed; but they should be exhibited cautiously, and combined with other remedies of a cooling and soothing nature. The tonics which we have most generally adopted, are, the decoction of Iceland moss, the decoctions of sarsaparilla, weak infusions of calumba, or of any of the mild mucilaginous tonics indigenous to India, and a weak infusion of catechu. These we have either

given alone, or combined with the carbonate of soda, the nitrate of potash, or the liquor ammonia acetatis, and medicines of a similar nature.

The repetition of blisters upon the epigastric region, and the insertion of a seton in the right or left side, are also means which ought not to be neglected, when others fail. More advantage than even these are calculated to produce, may be afforded by the early production of pustules in the above situations, by means of the ointment prepared with the tartarised antimony, and by keeping up a discharge from them. The occasional use of very hot poultices, when the symptoms are urgent, has often been productive of benefit in our practice; but they should be frequently renewed, and persevered in for several hours.

From considerable experience of the beneficial effects of the nitro-muriatic wash in indolent ulcers, we think that the use of water, rendered agreeably acid with equal proportions of the nitric and muriatic acids, as the common beverage, or three or four times daily, is calculated, in addition to the measures already stated, to be of considerable service. The trunk of the body may be also sponged twice daily with the same acid solution. We know, from the experiments detailed in our "Sketches of the Diseases of India" (p. 193), that the mineral acids dissolve and separate the viscid mucous secretion that sometimes is formed in the course of the disease, and lines the internal surface of the alimentary canal; and it would appear, from the experiments of Leuret and Lassaigne,* that "when the villous coat of the duodenum was exposed and cleaned, and then touched with diluted vinegar, the membrane exhaled a clear fluid, and the choledochus duct discharged much bile and pancreatic juice." These considerations, added to the fact that the gastric secretions are also acid, must shew that, in cases where the healthy character of the gastric secretions is altered by disease, the nitric and muriatic acids may be used with some benefit. We know that they are, generally in such cases, at least agreeable to the patient.

* *Recherches Physiologiques et Chimiques, pour servir à l'Histoire de la Digestion.* Par Leuret et Lassaigne, M.D.D., &c. Paris, 1825.

Great attention should be paid to the beverages used by the patient. The decoctions of barley, either the simple or compound, may frequently be taken with advantage, and common toast and water may also be used, either simply, or rendered agreeably acid by equal proportions of the nitric and muriatic acids, as recommended above. But on all occasions he should avoid every kind of spirituous or fermented liquor, and adopt whatever may prove most soothing and least offensive to the sensibility of the stomach. Imperial, made with a small proportion of cream of tartar, and weak lemonade, or barley-water, with a small proportion of nitre, may be tried, and taken as long as they are found to agree with the diseased organ.

SECTION V.

Precautions, for the adoption of those who are subject to Disorders of the Stomach upon Change of Climate, as respects Diet and Regimen, Air and Exercise.

MANY of the observations which have been already offered respecting diet and regimen, in the foregoing sections, are equally applicable here. In order, however, to the clearer understanding of what we have to offer on this head, we shall *first* briefly remark upon certain points appertaining to change of climate from Europe to warm countries; and, *secondly*, upon the precautions which the intertropical residenter should observe upon his return to the country from which he has been so long absent.

Upon departing from Europe, the visitor of warm countries should endeavour to adopt that kind of diet and regimen which he intends to pursue upon his arrival, provided that both the one and the other be on an abstemious or moderate scale. He should avoid, as much as possible, the use of salted provisions upon the voyage; and water should be his principal beverage. The state of his bowels ought regularly to be attended to; and he should take as much exercise as circumstances will admit of, without exposure to the

sun. The same precautions ought to be observed upon his arrival in the country; and if any of the symptoms of disorder of the stomach supervene, he should endeavour to remove them by abridging his diet, rather than by taking medicine of a stimulating or tonic nature, such as brandy bitters, which often aggravates the disorder, or procures merely a temporary relief. If medicine be at all employed, it ought to be of an aperient and cooling kind. Those who have delicately constituted digestive organs should avoid the fruits of the country upon their arrival, unless they be perfectly ripe and mild, and then they should be taken in small quantity. Above all, recent visitors of warm climates ought to avoid, as much as possible, all exposure to the direct rays of the sun; yet exercise is absolutely requisite, and should be used, without incurring fatigue, in the morning and after the sun has declined in the evening, and in every respect they should rigidly conform to the injunctions laid down for their guidance in preceding sections.* The particular kinds of diet which have been already noticed as productive of disease, should more especially be avoided by those who have weak digestive organs, or have experienced disorder in them before their departure from Europe. They will invariably find greater comfort and health from the adoption of a plain, digestible, and sufficiently nutritious food, than from the various heating, stimulating, irritating, and too nutritious meals frequently indulged in, and which excite an artificial appetite, and fever the system, without affording strength. They should also conform their dress, as far as circumstances will permit, to the temperature of the climate and to the sensations of the individual. The subject of dress is of greater importance to Europeans in India than is generally considered. We shall, therefore, direct the notice of the reader more particularly and more appropriately to this matter in the sequel.

More attention should be paid to the digestive organs, upon removal from an intertropical to a cold or temperate country, than the subject has usually received. Many, in consequence of the want of such attention, have left a warm climate in comparative good health, and have experienced disease upon

* See pp. 100 and 248.

their arrival in that country to which they had been so anxious to return. This has arisen entirely from their neglect of warm clothing upon their first approach to a colder temperature, and to insufficient care of the functions of the stomach, liver, and bowels. When an individual, whose cutaneous surface has constantly been kept in a state of free and copious perspiration, is exposed to the chills of a colder climate, the balance of the internal and external circulation, which had been so long maintained, is overturned, and the blood is repelled from the surface to the internal viscera, which, in time, suffer from the load, in proportion to the disposition to disorder which they may possess. The liver, bowels, and stomach itself, often suffer more or less in this way, and not infrequently the lungs become the seat of disease from the same cause. Now the indication in those cases is sufficiently apparent. The low temperature of our native climate suppresses an abundant secretion and excretion, which had been maintained upon the surface of the body for many years in a hot country, and which cannot be permanently restored whilst exposed to a cold atmosphere. We should, therefore, most obviously look for some other natural outlet for the exhalations and excretions now diminished or entirely checked upon the cutaneous surface; and at the same time keep up, as far as may be done, the accustomed transpiration of the skin by every suitable means. Conformably, therefore, with this view, the healthy functions of the stomach should be promoted by light and digestible food taken in moderate quantity, and by temperance and regularity in the hours of diet and repose. The functions of the liver should be regularly attended to, and the actions of the bowels promoted by appropriate means. Amongst these, the blue-pill, or this with the aloes and myrrh pill, or the latter only, should be taken at bed-time, according to circumstances; and a draught, consisting of infusions of gentian and senna, with some neutral salts, in the morning. These may be repeated, or continued according to the effects produced and the peculiarities of the case. Warm clothing ought to be adopted and proportioned according to the temperature of the atmosphere, and the temperament and ailment of the individual. Flannel should be worn next the skin, and the feet be especially kept warm at all seasons. Those subject to the derangements of the digestive organs already treated of, ought

to pay a careful attention to the remarks which will be offered on the subject of change of climate from India to Europe, after diseases of the liver and bowels, and which will appear in the sequel.

The chief danger to which those returning to Europe with impaired digestive organs are liable, is the supervention of either hepatic or pulmonary diseases. Many cases have come before us of individuals who had never complained of disorder in the liver whilst they remained in India, and yet, upon residing for some time in England, and paying little or no attention to the state of their stomach and bowels, hepatic disease of the most serious aspect had supervened, and in some cases proved fatal. Upon arrival in Europe, the invalid should endeavour to take exercise, especially upon horseback; and even those who have returned with little or no ailment should take sufficient exercise to promote the cutaneous functions, without carrying it to the length of fatigue, and, equally with those who have impaired their digestive functions and their health generally, ought to attend most scrupulously to the early signs of disorder in the chest; and, upon the first appearance of cough, or oppression, or tightness, or pain in this cavity, resort to depletions, and to such remedies as are calculated to promote the actions of the great secreting viscera and surfaces, and to carry off any morbid secretions or excretions which may have accumulated in the first passages. But it is not a mere discharge of such accumulations which ought to be attempted, but a continued action of the secreting and excreting organs ought to be promoted; and the diet, at the same time, should be regulated in such a manner as to diminish vascular action when it exists, and to keep up the strength, so as to enable suitable purgation to be instituted when debility commences. Much advantage will occasionally be experienced from a large dose of calomel given at bed-time, and followed by an active cathartic draught in the morning. The common black draught will answer the purpose sufficiently well; and if taken after 15 or 20 grains of calomel have been given, will carry off those morbid secretions which will continue to accumulate from time to time in those who have resided in a warm climate, after they have returned to their own country. But the occasional exhibition of this more active medicine

should not prevent the patient having recourse to gentle aperients, in order to keep up a regular action of the liver and bowels. For this purpose there is scarcely any thing better suited than the pills already noticed: and when chronic disorder exists about the liver, the artificial Cheltenham salts may be taken in addition, and the natural waters resorted to when the patient arrives in England.

PRACTICAL RESEARCHES
INTO THE
DISEASES OF INDIA, &c.

BOOK III.

OF THE DISEASES OF THE LIVER AND OF THE BILIARY APPARATUS.

DISEASES of the liver may be considered as endemic in the eastern hemisphere. According to the returns published in the preceding part of the work, the annual average per-centage of hepatitis in the East Indies is at least treble what it is in the western hemisphere. In the different divisions of the Bengal army, the annual per-centage of inflammations of the liver vary from three per cent to twenty-five, giving an average of thirteen per cent in the effective strength.* But this calculation is made with the *nominal* admissions. Calculating, however, from the imperfect data in our possession, the *actual* per-centage of admissions is much below what is now stated, and would appear to vary in this presidency from two to sixteen per cent, averaging between eight and nine per cent in the effective strength. In the different divisions of the Madras army, the *actual* admissions are ascertained with more precision; and although, of course, much below the nominal admissions, they vary in these divisions from six to thirty-five per cent,—the lowest per-centage

* See the Abstract Tables at p. 111 *et seq.* and the Tables given in the Appendix.

being in these provinces which more nearly approach those under the Bengal presidency, and the highest per-centage in the more southerly and most parched districts. These facts render it most probable that the difference in the per-centage of diseases of the biliary organs, particularly acute inflammation of the liver, is dependent, in a great degree, upon the nature of the soil and climate, and the mean annual height of temperature; hepatitis being more frequent in the Coromandel coast and southern provinces of India, where the annual range of temperature is highest.

The annual average of actual admissions of hepatitis in the effective strength of the Madras European army is somewhat more than twenty per cent;* and in the Isle of France and other parts of the same hemisphere, the annual per-centage ranges from eight to eighteen in the effective strength. But the number of cases given in the official returns as inflammations of the liver, forms only a part of the many instances in which the functions and structure of the biliary apparatus are diseased; for there are comparatively few cases of fever and dysentery, and even of diarrhoea and cholera, in which this part of the animal economy is altogether unaffected. Hepatitis, therefore, appears in the returns only when the liver has been the organ affected, or when it has betrayed disorder in the most prominent manner. We well know, however, that in a great many cases which have appeared, and been stated in official returns, as fever, as dysentery, and as chronic diarrhoea, dissection has disclosed most extensive disease in the liver. In some of these cases disorder of this viscus had never been suspected, and in others it had become manifest too late to be remedied. We are much inclined to extend the same remark to the fevers and dysenteries of the western hemisphere; and we believe that, although the annual average per-centage of admissions of hepatitis in the effective strength is as low as two per cent in some of the West Indian colonies, and never above ten per cent, as stated in the official returns,† averaging altogether as low as four and a half per cent annually,—disorders of the liver are actually more frequent than those returns make appear, and that those disorders are, in

* See Table-page, 160.

† See p. 186.

a great measure, masked, as in the eastern hemisphere, by concomitant or consequent disease.

But besides those more palpable instances of hepatic disorder, which appear in the official returns as inflammations of the liver, being immediately recognised as such upon their admissions in hospital,—and in addition to those cases of fever, dysentery, and diarrhœa, wherein the liver has been either in a state of co-existent or consequent disease,—there are other instances in which this organ is seriously affected; and yet they seldom come under treatment until more important disease has supervened, either in the liver itself or in some other viscus;—the primary disorder of this organ being productive of the consequent disease, which assumes the prominent features and attracts the whole attention of the practitioner, while, in fact, the primary disorder on which it depends is overlooked, and undiscovered unless when disclosed by dissection.

Believing, as we do, that various states of the functions of the liver, departing far from the healthy condition, although by no means amounting to inflammatory action, yet frequently terminating in it, very often exist without obtaining that degree of notice which their importance deserves,—we shall, in the first place, attempt to direct attention to them, and afterwards proceed to treat of the inflammatory and structural diseases which this organ has most frequently presented to our investigations during our practice in India.

CHAPTER I.

OF CERTAIN FUNCTIONAL DISORDERS OF THE BILIARY ORGANS.

UNDER the head of functional disorders may be embraced all those conditions of the liver and its appendages which depart from the healthy state, and are productive of uneasiness to the patient, and lead to further disease. These conditions, although affecting the quantity and quality of the blood circulating in the liver, and of the fluid secreted by it, are not necessarily allied to morbid structure, although, when neglected or improperly treated, they often terminate in inflammatory states and in alterations of the organization of the organ. Indeed, these latter derangements generally proceed from this source, either immediately upon the first functional disorder, or after repeated or long-continued attacks of it. Amongst the disorders of the biliary organs embraced under this head, most frequently occurring in warm climates, are, increased secretion of bile, congestion of blood in the liver, congestion of bile in the biliary ducts and gall-bladder, and torpid function of the liver itself. To each of these we shall direct attention, before we enter upon the consideration of inflammations of the organs concerned in the secretion and excretion of the bile.

SECTION I.

Of an Increased Secretion of Bile.

ONE of the earliest effects of change from a cold or temperate climate to a very warm one, upon the European constitution, is an increased secretion of bile. This Dr. Johnson has ascribed to a sympathy existing between the hepatic functions and those of the skin, the former being increased when the latter is augmented. That an increase of these functions is generally co-existent, particularly soon after the European has arrived in an intertropical country, cannot be doubted; but, with all due deference, we cannot so readily concede that the increase of the biliary secretion is so immediately the result of sympathy with the functions of the skin, as this author infers. The sympathy that exists between the skin and the internal viscera generally, we do admit; and in the treatment of disease, a knowledge of, and due attention to the fact, are matters of the very first importance; but we are much more inclined to adopt a different explanation of the phenomenon of increased secretion of bile, and one which we find has been assigned to it by other pathologists in different parts of the world, without any apparent knowledge of one another's ideas on the subject. It has been ascertained, by the experiments of Crawford, Lavoisier, and Sequin, and of Dr. Prout and Dr. Fyfe, afterwards repeated by Dr. Copland, in a warm climate, that the quantity of carbonic acid gas, formed by respiration in a given time, is much diminished in a high temperature, and under circumstances which lower the powers of life. This being established by numerous experiments, undertaken by individuals entirely unbiassed by previously conceived opinions on the subject, it becomes a basis on which much important speculation respecting the origin of several intertropical disorders may be founded.

If, therefore, less carbon is evolved from the blood by respiration, in a given time, in a warm climate than in a cold one, whilst the quantity of

carbonaceous materials conveyed into the circulation is equally great, it must follow, that this substance will soon be greatly in excess, provided that the function of eliminating it from the blood, (which is discharged by the lungs, in a diminished ratio in a warm climate,) is not performed by some other organ. Thus, therefore, there is one of two states to be expected to supervene in Europeans upon their arrival in a warm climate, namely, that owing to the diminished excretion of carbon through the medium of respiration, this substance will be either in excess in the blood, or be eliminated by the vicarious increase of the function of some other organ. But bile is chiefly formed of carbon and hydrogen; therefore, when this secretion is increased, a larger quantity of carbon will be eliminated from the circulating mass, and thus the excess of this substance in the blood will be guarded against. The observations now offered with respect to carbon, may be equally well applied to the quantity of aqueous vapour given off from the blood in the lungs; for, in a high temperature, when the air is already saturated with moisture, a much less quantity of aqueous vapour will accompany the expired air, than in a cold and dry state of the atmosphere; and thus the aqueous part of the blood will be in excess, if it be not excreted in greater abundance by some other part of the animal economy. Hence it is that the fluid excretions of the skin, the secretions of the liver and of the mucous surface of the alimentary canal, become so frequently augmented in warm and moist climates; and when this is the case, a considerable portion of carbon is also evolved from the system, in the state of carbonic acid gas.

From the experiments of the physiologists mentioned above, and from the foregoing remarks, it may be inferred that, owing to the diminished formation of carbonic acid gas in the lungs, during a high temperature of the atmosphere the secretion of bile may be expected to be increased, and the liver may be considered, in a warm climate, as performing an increased office, in proportion as the influence of respiration upon the blood in the lungs is diminished. Thus we have a very important fact in the causation of those disorders which are attended with an increased secretion of bile accounted for, namely, that such disorders increase in frequency and in severity with the rise in temperature, and with the prevalence of those other causes which

diminish the changes produced upon the blood by respiration. What those other causes are, besides the rise of temperature, may be gathered from the experiments of the already-named physiologists. Dr. Prout and Dr. Fyfe found, that the changes induced upon the blood by respiration are diminished during sleep, by the depressing passions of the mind, by fatigue, by the use of vinous and spirituous liquors, especially when taken upon an empty stomach, by low diet, by mercurial irritation, and by whatever diminishes the powers of life. Dr. Copland, moreover, found that the changes effected by the air in respiration, in those experiments which he performed in a warm climate,* were even to a less extent, and furnished much less carbonic acid gas in a given time, than those experiments which he performed in an artificially increased temperature in a cold climate; and this further diminution of the changes effected by respiration upon the atmosphere in a very warm climate, he imputed to the presence of malaria, and to the circumstance of more moisture existing in an intertropical atmosphere than in an artificial high temperature in a cold country. His observations are: "In an intertropical country we found the diminution of the quantity of carbonic acid to be considerably greater than that which our experiments in an artificial temperature of equal elevation had furnished. This seems to be accounted for by the depressing influence upon the nervous system, which the atmosphere, loaded with moisture and malaria, may be reasonably expected to produce. We may also attribute a share of this discrepancy to the increased function of the skin, which evidently co-operates, in hot climates, with the lungs, and performs a subordinate respiratory function." In these views we agree with this pathologist. Entirely unacquainted with the deductions which he had drawn from these experiments in this country, and with similar inferences deduced by Dr. Pierson in America, we considered that, owing to this state of diminished function of the lungs, and to the undiminished transport of carbonaceous materials into the blood, those substances, which are usually separated from the system by respiration, must exist in excess, unless eliminated by the increased function of some other organ. The composition of the bile readily pointed out the liver as the viscus performing this increased

* See Appendix to Richerand's Physiology, p. 626.

office in Europeans during their residence in a warm climate; and to our minds, the relation subsisting between the temperature of a country and the prevalence of diseases characterised by increased secretion of bile, and disorders of the biliary organs, was thus accounted for. This opinion was confirmed by our experience of intertropical diseases, and was stated in our *Sketches of the Diseases of India*; but it was not until lately, that we found that Dr. Copland first in this country, and subsequently Dr. Pierson in America, and Mr. Down, had deduced similar inferences from the data above alluded to, without any apparent knowledge of each other's sentiments on the subject.* We state this as evidence in support of our views: and as we consider these views, thus concurrently and independently entertained by four pathologists in different quarters of the globe, founded in truth, and leading to important conclusions, both in a pathological and therapeutical point of view.

That increased secretion of bile is evident in all Europeans immediately upon their arrival in India and other warm climates, cannot for a moment be doubted by any who have visited intertropical countries, or who have observed the character of the disorders occurring in temperate or cold regions during summers and autumns of unusual warmth; and it will be as readily conceded, that this increase and disorder of the biliary secretions are in proportion to the elevation of the temperature into which the natives of cold climates are transported. But not only are the disorders experienced by Europeans upon their removal into a warm country, characterised by an exuberant secretion of bile, but the excess of this secretion generally, in the first instance, is the immediate cause of disorder,—all the derangements first experienced arising from this cause, and usually disappearing when it is removed. Of this fact, the following cases are satisfactory proofs.

CASE X.—*Diarrhœa from increased Secretion of Bile.*

GEORGE HUGHES, aged 21, admitted 13th June, 1819. Has been complaining for several days of purging of bilious matter, with slight sickness and bitter taste in his

* See Medical and Physical Journal, vol. xliv.

mouth. Pulse but little accelerated; tongue white and foul; stools yellow and yellowish-green, and without blood. No pain in the abdomen or side, but considerable scalding at the rectum on passing the motions.—Pulvis emeticus statim. Calomel. gr. xij. h. s. s.; aquæ Cheltenham. ℥v. primò manè.

14th.—The emetic brought away a great quantity of pure bile; and the purging medicine discharged much bilious, tenacious, and feculent matter. Feels quite well.—Capiat aquæ Cheltenham. ℥vj. cras manè.

15th.—Quite well. Discharged.

CASE XI. — *Increased Secretion of Bile, producing Nausea, &c.*

JOHN YOUNG, ætat. 17, lately arrived from Europe, admitted 20th May in the evening, complaining of sickness at stomach, bitter taste in his mouth, and frequent purging. The conjunctivæ somewhat yellow; skin foul and dusky; stools consisting chiefly of bile. Pulse soft, but quick. No headach.—Mistura emetica statim.

21st.—The vomit operated most freely, and brought away a great quantity of bile. The bowels have not acted since the emetic.—Pulvis purgans statim. Capiat etiam calomelanos, gr. xij. horâ somni, et aquæ Cheltenham. ℥vj. cras primò manè.

22d.—Sickness and bitter taste have disappeared. Gripped from the medicine, which has acted copiously, and brought away a great quantity of bile.—Pulv. purgans h. s. et aqua Cheltenhamii, cras manè.

23d.—Stools consist chiefly of yellow bile. Feels quite well.—Continuentur pulv. et aqua.

24th.—Quite well. Discharged.

CASE XII.—*General Disorder from increased Secretion and Accumulation of Bile.*

SAMUEL KELLY, aged 27, admitted the 7th November, 1815. Complains of fever, headach, and general uneasiness. Pulse but little accelerated; bitter taste in his mouth; bowels open.—Habeat statim haustus emeticus antimonialis.

8th.—Vomited a great quantity of green bitter bile, and had three stools, consisting almost entirely of bile. He feels much better this morning.—Capiat statim pulv. purg.; et horâ somni, calomel. gr. x. Repet. pulv. purg. cras primò manè.

9th.—Feels quite well. Discharged.

Remarks.—The foregoing three cases are examples of a numerous class of entries in the case-books of the European Regimental Hospital and General Hospital at

Madras, and are taken indiscriminately from amongst many hundreds of a similar description. They have been usually denominated bilious; and we believe that this very generally, but too loosely applied denomination, cannot be more appropriately made use of than in relation to this particular form of disorder. It will be observed, that the purging subsided upon the operation of the emetic, and that all disorder disappeared as soon as the too abundant and irritating secretion was entirely removed. The green-coloured state of the motions, and of the matters vomited before any medicine had been exhibited, is of itself a satisfactory proof that this colour of the evacuations was not the consequence of the calomel and other substances prescribed. The belief that this particular appearance of the stools proceeds from the purgative employed, and not from the disordered state of the secretions themselves—an opinion but too generally entertained amongst practitioners in this country—has, we are confident, operated unfavourably, both as respects the success of the practice and welfare of the patient, on many occasions. It should, however, be recollected, that the particular purgative, to which this colour of the alvine evacuations has been so frequently, and indeed generally imputed, cannot communicate the appearance under consideration; and that, as far as the matter admitted of being placed beyond doubt by means of experiment, the supposition that calomel communicates a green or dark-green colour to the stools has been completely disproved.*

These green secretions, we conceive, are formed before any purgative has acted, or any medicine been given; and the secretion becomes changed to a bright orange or yellow, so soon as this morbid and accumulated matter has been removed by the operation of purgatives; shewing distinctly that the green colour is not the effect of the medicine, but of the disease. The experiments alluded to in our *Sketches of the Diseases of India* prove that calomel and bile, separately applied to these secretions, produce precisely the same effect; namely, that of attenuating and separating the viscid and tenacious matter lining the alimentary canal; and when they are both *combined* in the same operation on that matter, they produce green stools. The Cheltenham water, mentioned in the treatment of the foregoing cases, was a weak solution of the sulphate of magnesia.

The foregoing cases convey some idea of the slighter forms of disorder resulting from the influence of a warm climate upon Europeans. But it is only one of several modes in which the functions of the biliary organs become

* See *Sketches of the Diseases of India*, pp. 192—5.

deranged; the chief origin of such disorder, in almost every case, being more or less dependent upon the manner in which the function of respiration becomes affected in Europeans, upon their removal into a higher range of temperature than that to which they are adapted by organisation and habit. We have already attempted to shew, and have supported our views by similar opinions entertained by several eminent experimenters and physiologists, that an increase of the biliary secretions in a warm climate is a necessary consequence of a diminished state of function in the lungs; and that, in consequence of such diminution of the changes effected by respiration upon the blood, during considerable elevations of temperature, those materials which should be conveyed from the system by the respired air must soon be in excess, provided that the supply continues undiminished; or, in other words, provided that these materials are carried into the circulation, through the medium of the digestive organs, and owing to the nature of the food, in greater quantity than they are eliminated from it by respiration, unless some other organ supplies, by a vicarious state of its function, the diminished office of the lungs. The organ which, in our opinion, and in that of the authors to whose authority we have referred, takes upon itself this vicarious office, is the liver; and it seems to perform this duty more from the circumstance of those materials whence bile is formed being conveyed to it in the blood in much greater abundance than usual, than from any absolute or primary increase of its vital actions. The abundance of the constituents of the bile conveyed by the circulation to this viscus, seems to facilitate its operations in the formation of this fluid, and to stimulate it to increased action; and if this secretion be not duly discharged from the biliary ducts and gall-bladder, but, either from the state in which it is secreted, or from any other cause, accumulates in these situations, until it acquires properties of an irritating and hurtful tendency, much constitutional disorder may be the result; and this disorder may assume various features, according to the habit and temperament of the patient, and the concurrent circumstances in which it may supervene.

In order to illustrate this part of our subject, we shall *first* offer some remarks, and detail a few cases, shewing the forms of ailment more generally met with in practice, proceeding from an increase, and perhaps disorder, of

the secretion of bile ; and, in the *second* place, we shall make a few observations upon certain points connected with this department of pathology, and upon the measures which should be adopted in order to moderate the exuberance of this secretion, when in simple or morbid excess.

First, increased secretion of bile seldom takes place without a change from its healthy characters. During an exuberant flow of this fluid, a considerable portion of it is conveyed into the gall-bladder, where it undergoes, partly from the absorption of its more fluid parts, and partly from the admixture of the secretion poured out from the mucous follicles of the gall-bladder, important changes, and acquires more acrid properties. With an increase of secretion also, an augmented flow of blood generally supervenes ; for, conformably with the laws generally observed to obtain in the animal economy, there can be no increase of secretion without an augmented supply of the fluid or materials whence such secretion is derived. This augmentation in the flow of blood is frequently still greater when the secretion is possessed of acrid and stimulating properties : for acidity is productive of irritation ; and wherever irritation exists, an increased afflux of the circulating fluid is the necessary consequence.

This increased afflux of blood may amount to what is usually called active congestion, or increased determination, in the first instance ; and this state, if not arrested by treatment, or not subsiding spontaneously, may run on to inflammatory action, differing in degree according to the peculiarities of individual habit and temperament, and the circumstances of the case. But the increased determination of blood to the liver is not always to be considered as a necessary consequence of an increase of the biliary secretion, although we believe that more generally active determination of blood either precedes or is consequent upon an augmented secretion of bile. We are perfectly convinced, from a close inspection of the appearance of the blood, when taken from a vein during the premonitory stage of intertropical diseases, and after comparing it with the blood drawn afterwards, when a full secretion of bile had been for a considerable time going forward, that in the first stage of disorder there existed certain materials or elements in the circulation which

were incompatible with the healthy discharge of the functions, and upon the presence of which a great share of the disorder seemed to depend. Our attention was first attracted to this subject, many years ago in India, when bleeding a man suffering under acute rheumatism, attended with a torpid or inactive state of the liver. In his case the blood presented a very dark or pitchy tinge, with an oleaginous appearance on the surface, — characters which disappeared after the actions of the liver had been for some time established. The result in this case raised a belief in our mind, which much experience has fully confirmed, that those materials or elements whence bile is formed existed in the blood greatly in excess upon the first occasion of depletion, and were productive of much constitutional disturbance; and the very copious discharge of green bile, which is generally observed to follow upon this dark and thick state of the blood, resulted from the abundant supply of the constituents of the bile which this condition of the blood furnished to the liver. When the functions of the lungs and of the liver become diminished at the same time, in a warm climate, the one owing to a permanent cause — the high range of temperature, the other to temporary and accidental circumstances, whilst the blood continues to receive that exuberant and rich supply of carbonaceous and hydrogenous materials which animal food furnish, the supervention of much serious disease cannot be doubted, and in general it first makes its appearance in disorder of the hepatic functions. The excess of materials for the formation of bile, as we have already argued, excites the liver to increased action; and thus the cause of mischief is removed with but little, or at least a short-continued, disturbance of the economy. But if, owing to any organic disease of the liver, or to any important lesion of its functions, it be incapable of performing the necessary extent of office, disorder may become more serious and of longer duration.

During the first impression of the exciting causes of disease, and for some time afterwards, the nervous system has its energies greatly impaired; and this state is more remarkably observed during the cold stage, or the premonitory period of disorder, which answers to the cold stage of fevers. In this state of disorder the functions of all the viscera are considerably diminished, and, consequently, those changes which are effected upon the

blood by the secreting viscera are but imperfectly performed. Congestion, or stagnation of the blood in the larger veins and internal viscera, frequently supervenes; and during this state, the venous character of the blood, and the predominance of its carbonaceous and hydrogenous elements, which it already possesses in a high degree, become still further increased; so much so, that if the powers of life did not re-act under the load of congestion by which they are nearly overwhelmed, and thus enable the great secreting viscera to re-establish their functions, and remove a great share of the cause of disorder, the life of the individual would soon become extinct. In many cases, when the efficient cause of disorder is very powerful, and the venous characters of the blood very decidedly marked, and attended with extreme congestion of the internal viscera, the powers of life actually sink under the load, without any effort, or with very inefficient efforts, to remove it. Such instances are met with in the cold fit of some agues, when the constitution of the patient has been much impaired, and in the early stage of the epidemic cholera. In the latter disease, the blood taken from a vein possesses, as we have very fully shewn in our treatise on the epidemic cholera,* the venous characters in the highest degree; and even the blood flowing from an artery, at the time when internal congestion is at its height, presents well-marked venous characters. In such cases, the efficient causes of disease affect the energy of the nervous system, and co-operate with the influence of climate upon the circulation in impairing the activity of the eliminating and secreting functions of the internal viscera, and in diminishing the purity of the blood; and this impure state of the circulation, and the accumulation of hurtful materials existing in it, unfit it for the offices it is destined to perform, and further tend to perpetuate, and even to increase, that condition in which its own disorder depends, and to annihilate at last the powers and functions of life.

When sufficient energy remains in the system to enable the chief secreting viscera to act, to carry forward the blood circulating towards them, and to form those secretions which it is their office to elaborate from the blood,—

* See Sketches of the Diseases of India.

and upon the due elaboration of which the pure and healthy state of this fluid depends,—the healthy actions of the system are restored, and the animal machine assumes its usual tenour of action, if no part of its very complex organisation have received injury during the struggle.

But we believe, that not only may the purity of the circulating mass be affected in the very general way now argued for, and of which familiar instances may be adduced from amongst fevers, cholera, and dysentery, but that, owing to causes acting in a partial manner, or to a limited extent, upon the economy, the circulation in particular organs, or in a particular series of vessels, or in the branches of a particular venous trunk, may assume appearances of impaired purity, and may possess the venous characters, as respects darkness of colour and diminished state of fluidity, in a much greater degree than the blood circulating in other parts of the system. From the appearances of the fluid when drawn by leeches and scarification, in different parts of the body, when suffering under symptoms of congestion, or of its opposite, increased arterial action, we are fully convinced that very dissimilar states of the circulation may exist in different parts of the body at the same time, as regards its sensible properties. Blood, for instance, drawn in the vicinity of, or from a part suffering under congestion of its veins, will be possessed of very distinct characters from that taken from another part in the same individual, where no such interruption or congestion is present. This is a point which must be familiar to every experienced practitioner, and is of more importance than has been commonly attached to it; for, in cases where local congestion is considerable, the same dangerous consequences, which we have already stated as sometimes supervening upon a general state of venous congestion and vascular impurity, may supervene locally, and the functional capabilities, or even the vitality of the part, may suffer from the distension, and the condition of the blood with which it is loaded. In such cases, as indeed in the majority of those in which the vascular system is more generally affected, and the blood itself loaded with effete and noxious elements, the object is to promote circulation, at the same time that we attempt, by exciting the secreting viscera to increased action, to procure the discharge of the hurtful materials. Hence it is that

general depletions, in a warm climate, are beneficial when the evil is extensive; and local evacuations, when a single organ or set of vessels suffer the chief load of disorder. But at present to pursue this subject further than its more general relations, would be anticipating what we shall have to advance respecting it when it will come more appropriately before us.

In the great majority of cases, it is observed, as has already been remarked, that the biliary secretion, when excessive in quantity, is, to a greater or less extent, altered in its properties. It is very probable that the great abundance of the constituent elements whence bile is formed, existing in the blood of Europeans in warm climates, conduces to a more concentrated and stimulating, or even irritating, state of this fluid, than in temperate and cold countries. It is, however, a matter of great difficulty to ascertain whether the acrid and irritating, qualities which the bile most undoubtedly presents on many occasions, are owing to its original state of secretion, or to properties acquired by it in consequence of its remora in the biliary ducts and gall-bladder. We are inclined to believe that these qualities may supervene in both ways, and that, moreover, in whatever degree it may be possessed of them upon its secretion, it will generally acquire them to a much greater extent after having been retained for some time in the apparatus concerned in its elaboration.

Increased secretion of bile is a very frequent concomitant of inflammations of the liver, and is particularly characteristic of some forms of fever, particularly of bilious inflammatory fever and bilious remittent fever, of dysentery, of diarrhœa, and of cholera morbus, under each of which heads it will receive due consideration. We shall, at this place, merely adduce some cases in which inordinate flow of bile was unconnected with these forms of disease, and yet in some was productive of disorder very nearly approaching one or other of them.

During the period of increased secretion of bile, the irritation occasioned by the flow of the stimulating fluid along the mucous surface of the alimentary canal will be productive, in many cases, of much constitutional disturbance,—will occasion great thirst, giddiness, and pain in the

head,—an accelerated pulse, and white and excited tongue,—and thus give rise to the phenomena characterising a slight attack of fever, and even to those of bilious inflammatory fever. The cause of disorder may, however, be readily recognised, and the symptomatic form of disorder detected, from the copious biliary flux, the absence of the premonitory symptoms of fever, and the usual rigors and chills which usher in idiopathic fever, and by the speedy subsidence of disorder upon the removal of its cause. The following cases will fully illustrate this topic.

CASE XIII.—*Increased Secretion of Bile, with Determination of Blood to the Liver.*

JAMES GIBSON, M. E. Regt. ætat. 18, just arrived in India, admitted into the General Hospital this evening, August 1, 1819. Complains of purging, griping, and straining. Motions green coloured, watery, and consisting almost wholly of bile; slight pain in the right hypochondrium; urine high coloured; pulse quick and full; skin hot, but moist; tongue very foul. Complaints of three days' standing. Apply fifteen leeches to the side immediately.—Enema purgans stat. R Cal. gr. x.; pulv. ant. gr. iij. syr. q. s. ft. pil. h. s. s. Pulv. jalap. comp. ʒj. early in the morning.

2d.—Considerably relieved by the leeches. Pulse very quick; skin hot; tongue loaded; stools consisting of a green-coloured bile; still feels pain in the hypochondriac region; no pain in his shoulder, and no difficulty of breathing. Repeat the leeches to his side.—Mist. purgans, ʒiij. stat.; calomel. gr. xx. h. s.

3d.—Pain in his side better, though it still continues a little. Tongue very foul; pulse firm, rather hard, 86 in a minute; skin moist. Well purged; stools more natural.—Pulv. purgans stat.; pil. hydr. cum calomel. et pulv. ant. no. 1, three times a day. Mist. salin. febrif. cum ant. tartar. gr. jss., a wine-glass every two hours.

4th.—Tongue cleaner; is griped this morning; pulse as before. Feels pain on pressure immediately under the umbilicus. Apply twelve leeches immediately.—Pulv. purgans stat. et pil. Cont. mist. salin. ut antea.

5th.—Pain in his belly removed by the leeches. Tongue foul; pulse good.—Mist. purgans stat. Cont. mist. salin. et pil.

6th.—Feels much better. The medicines have purged him freely; stools of a dark-green colour. Complains of griping. Tongue excited and foul; skin natural; pulse good.—Repet. mist. purgans. Cont. mist. salin. ut antea, et pil.

Evening.—Stools not so dark coloured; tongue cleaner.—Cont. mist. salin. febrif. et pil.

7th.—Has still griping; stools more natural, and still bilious; tongue foul.—
Haust. amar. cum sennæ, ℥ij.; tinct. jalap. ℥ij. M. ft. haust. Cont. pil. ut antea.

8th.—No griping; stools natural. Cont.

These medicines were discontinued on the 10th; he was perfectly well, and returned to duty on the 12th of August.

Remarks.—The increased secretion of bile chiefly proceeded, in this case, from the increased flow of blood to the liver; and the stools seemed to indicate that much of this secretion had accumulated in the biliary organs, and given rise to the excitement of them characterising the progress of the case. The treatment was directed with a view of diminishing the determination to the liver, of carrying off the redundant bile, and of exciting a healthy action of the organ.

CASE XIV.—*Increased Flow of Bile, inducing Inflammatory Action in the Bowels.*

JAMES GROVES, a corpulent and robust man, ætat. 27, recruit, 22d June, half-past six, P.M.: admitted this evening, with severe pain across the umbilicus, and sickness at stomach; says he has been purged frequently. Motions consist chiefly of bile; pulse small, and somewhat oppressed; skin rather hot; great thirst; tongue excited; no headach; respirations natural. R Hydr. submur. gr. xx.; opii puri, gr. ij.; cons. rosæ, q. s. fiant pilulæ ij., statim sumendæ, cum haust. infrà præ. R Mist. camph. ℥jss.; liq. ammon. ℥xx. M. ft. haust. Hab. enema purgans stat. App. hirud. xx. abdom.

Half-past Eight, P.M.—Pain in his belly considerably relieved; but he feels it still very acute occasionally. The leeches have performed their duty well. Skin natural; pulse 108, and full; thirst urgent; very restless; complains of slight headach.—V. S. ad ℥xxx. stat. Hab. potu acid. nitr. ad libitum; fatus pro abdom. Repet. enema purgans.

23d.—Stools feculent, and of a brown colour; some pain still in his belly; tongue white, and furred; pulse 100, and soft; skin natural; head easy; no sickness; the blood drawn is cupped, but no appearance of buff.—Sumat mist. purg. ℥ij. Repet. hirud. xx. abdom. Capiat mist. salin. compos. ℥jss. 2dis horis.

Vespere.—Purged very freely; stools foul and offensive; pulse calm; skin natural; tongue clean; belly easy.—Repet. pilul. ij. ut heri præ. h. s.

24th.—Has had no stool since last evening; belly easy; tongue clean; pulse and skin natural.—Repet. haust. purg. stat. Cont. mist. salin. Spoon diet.

25th.—Stools better; tongue clean; pulse and skin natural. Cont. med.

26th.—Stools rather dark and offensive; pulse, skin, and tongue, natural; com-

plaints of pain in his right ear, which kept him from sleep all night. Syringed. — App. hirud. jv. parti dol. Cont. med.

Vespere. — Ear still painful; no stool. — Hab. enema purg. Repet. hirud. vj. stat.

27th. — Stools natural; pain in his ear relieved; and he feels well. Continue medicine. Complains of pain in his groin, which feels hot to the hand. He also complains of return of pain in his belly; some tension of abdomen. Pulse 100, and rather sharp. — App. hirud. xx. et foment. parti dol. R Pulv. jalap. com. ʒj. stat.

28th. — Medicine purged him freely. The pain in his belly is relieved; but he feels a general soreness over the abdomen. Pulse 104, and sharp; respiration rather hurried; tongue excited; thirst urgent; no appetite; and he is very restless. — V. S. ad ʒxv. R Mist. purg. ʒiij.; ol. menth. mʒij. M. stat. Cont. mist. salin. ut antea.

Vespere. — Alvine evacuations dark and fœtid; pulse soft; skin cool; the soreness of his belly continues, but he feels no pain; tongue much excited; great thirst. — R Pilul. aloët. cum col. ter die, et haust. amar. cum sennæ, ʒiij. bis die. App. empl. lyttæ ampl. abdom. Potu ex decoct. oryzæ et cryst. tart. ad lib.

29th. — Says he feels relieved by the blister, which rose well. Tongue excited; pulse 98, firm, and somewhat irritable; skin quite natural; no stool since last evening; no headach; great thirst; and his appetite continues impaired. Says he feels very weak. Cont. med. Hab. enema purg. bis die. Sago and wine diet.

Vespere. — Stools scanty, rather light coloured, and offensive. Says he feels great pain in his bowels; tongue much excited; pulse and skin natural; great thirst; some difficulty in passing his urine: he is extremely restless, and says he would give five pounds if he could get to sleep for one hour. — Hab. enema anodyn. necnon balneum tepidum. Cont. med. Cont. potu ut heri.

30th. — Says he had some sleep after the bath, and he feels quite easy this morning. Skin rather hot, but moist; pulse good; tongue foul; thirst continues, and his appetite is still impaired; has had no stool since last evening. — R Ol. ricini, ʒij. stat. Cont. alia.

Vespere. — Stools perfectly natural; pulse and skin natural; tongue moist. Cont. med. — He recovered in a few days.

Remarks. — The increased secretion of bile was obviously attended with determination of blood to the liver in this case; and the morbid condition of the secretion evidently had induced an inflammatory condition of the mucous surface of the bowels. In order to remove these states, or to arrest their progress, general and local blood-letting was prescribed; the habit and constitution of the patient, and his very recent arrival in the country, rendering depletion as much a matter of caution as of cure.

CASE XV. — *Copious Discharge of Bile, producing Inflammatory Excitement of the System.*

JAMES GOODMAN, ætat. 17, recruit, just arrived, admitted into the General Hospital August 12, 1819, at half-past six o'clock this evening, with purging and vomiting, which attacked him at four o'clock, P.M. No spasms. Says he has vomited bitter watery matter; and his stools are now also watery, but of a deep-yellow colour, and consisting almost entirely of bile. Had severe pain at the region of the stomach, and in the head, with giddiness.—Twenty-two ounces of blood were taken from his arm before he left the fort. His skin is hot, but moist; pulse quick and firm, not full; the giddiness and pain at the scrobiculus cordis continue the same. Apply ten leeches to each temple, and fifteen to the scrobiculus cordis. Calomel. gr. xx. stat.

Nine o'Clock, P.M. — Has not had any stool or vomiting since admission; pain in his head and in the scrobiculus cordis much better; tongue white and excited; considerable thirst; pulse 68, firm, and regular; skin natural.—Enema purgans stat. Repet. calomel. gr. xx. h. s. s. Mist. purgans, ℥ij. the first thing in the morning.

13th.—Pulse 90, full, and strong, with a sharp beat; stools copious, morbid, feculent, and bilious; tongue excited; pain and giddiness in his head better; the pain in his stomach is less, though he still feels it; thirst urgent.—Apply sixteen leeches to the epigastric region. Mist. salin. febrif. cum ant. tart.

14th.—Feels very well this morning; all his complaints have left him.—Mist. purgans, ℥ij. stat. Cont. mist. salin. ut antea.

15th.—Bowels quite regular; no pain; no complaint.—Cont. mist. purgans.

16th.—Perfectly recovered; but continued the saline mixture till the 20th, with an occasional purgative. He was then discharged.

Remarks.—The giddiness, pain at stomach, and constitutional disturbance, were here obviously the consequences of the copious flow of bile into the alimentary canal. The bleeding was prescribed more with a view of preventing the supervention of inflammatory action, than for the purpose of subduing what may have existed at the time. We are convinced that, owing to the neglect of this precaution in similar cases, particularly in the plethoric and sanguine, and to the want of due attention to the propriety of carrying off the diseased bile poured into the alimentary canal, many cases, at first consisting of a redundant discharge of morbid bile, are converted into dysentery. This topic will receive due attention from us when the subject of dysentery comes before us; and the complications of that disease with disorders of the liver and its secretion will then be considered.

CASE XVI.—*Increased Discharge, with augmented Secretion of Bile.*

C. ROSS, recruit, ætat. 17, admitted in General Hospital 14th August, at four o'clock P. M., with purging of bilious watery matter, by his own account, which seized him about six this morning; has not had any spasms, but complains of severe pain at the stomach and in his head; pulse quick and sharp; skin warm; tongue foul.—Calomel. gr. xx. stat. V. S. $\bar{\text{z}}$ xvj. Apply twelve leeches to the stomach. Enema purgans stat.

Eight o'Clock, P. M.—Feels much better, but the pain in his head continues; passed some hardened lumps of fæces with the enema; stools bilious.—Apply sixteen leeches to the temples immediately, and rep. enema.

15th.—Pulse 76 this morning, and regular; has no pain of any kind.—Mist. purgans. $\bar{\text{z}}$ ij. stat. et rep. enema ut antea.

Eight o'Clock, P. M.—Very much better; stools copious, with hardened lumps of fæces, and highly bilious.—Calomel. gr. x. h. s.

16th.—Much better; has been purged; he has no complaint.—Mist. purgans stat.

17th.—Perfectly well, excepting the bilious state of his stools.—Haust. amar. cum sennæ $\bar{\text{z}}$ ij. nocte manequ: this was given till the 23d; copious discharges of bilious matter continuing until then, when he was discharged.

Remarks.—The disorder in this case was evidently the result of the copious flow of bile into the alimentary canal, after having been retained for some time. The state of the stools evinced that the bowels had been previously neglected; and that the secreting function of the liver, being over-excited, continued increased for several days. Depletion was prescribed on account of the pain in the stomach and head, and to guard those organs from impending disorder.

CASE XVII.—*Copious Discharges of Bile, producing much Constitutional Disturbance.*

RICHARD GREENHOW, ætat. 23, a recruit, just arrived in India. 13th August, 1819. Admitted into hospital this morning, with pain and uneasiness at the scrobiculus cordis; had one loose stool; no vomiting, but complains of sickness at stomach, pain in his head, giddiness, and lightness; tongue very much loaded and excited; pulse 120, but not full or sharp; complains of great debility; skin natural; very thirsty. Apply six leeches to each temple, and fifteen to the epigastric region.—R Calomel. gr. xx. stat., and in three hours give $\bar{\text{z}}$ ij. of the purging mixture.

Nine o'Clock, P. M.—Feels much relief from the leeches; medicine has purged him; pulse firm, rather quick and sharp; says he feels very weak and light headed; skin hot, but moist; tongue loaded; the medicine gripes him, but it is acting well; thirst urgent.—Calomel. gr. xx. h. s. s. V. S. $\bar{\text{z}}$ xviii.

14th.—Tongue excited and white; pulse full and vibrating; feels sickness at stomach, and he has still lightness of the head; had very little griping; was sick in the night, and vomited some bitter bilious matter; he now feels a bitter taste in his mouth, and nausea.—Mist. emetic. every ten minutes till it operates, and give plenty of warm water.

Nine o'Clock, P. M.—Has vomited a great quantity of bitter bilious matter, and is greatly relieved; head better; pulse good; skin natural.—Calomel, gr. xx.; pulv. ant. gr. vj. h. s. s.

15th.—Has passed a large lumbricus by stool; feels much better; the purging mixture which he took early this morning is operating well, the stools consisting of bile.

Eight o'Clock, A. M.—Feels very uneasy and sick at stomach.—R. Mist. camph. $\bar{\text{z}}$ j.; aquæ ammon. mxx .; spirit. æther. nitros. mxxx . M. ft. haustus, statim sumendus.

16th.—Much better this morning in every respect.—Mist. purgans stat. et calomel. ut antea h. s.

17th.—His head is not quite well, though better; feels very weak; tongue foul.—Mist. salin. febrif. cum antim. tart. gr. jss.; a wine glass full every two or three hours.

18th.—Feels a foul disagreeable taste in his mouth; tongue foul; head quite well.—Mist. emetic. stat.; after its operation, contin. mist. salin.

19th.—Much better; tongue clean; vomited much bile.—Contin. mist. salin.

20th.—Feels quite well, but no appetite.—Mist. amar. cum sennæ $\bar{\text{z}}$ ij. nocte maneque.

21st.—Greatly better.—Contin. This was continued without any alteration till the 25th, when he was discharged, quite well.

Remarks.—The violent febrile commotion, which in this case was not preceded by the usual premonitory symptoms of fever, arose entirely from increased secretion of bile and an undue accumulation of it upon the biliary organs and prima via. The treatment adopted had for its object the speedy discharge of the redundant secretion, and arrest of the constitutional disturbance—points which the *depletion* and *emeto-catharsis* were in this case well calculated to accomplish. Depletion was here the

more required, as the patient had recently arrived in the country. Copious dilution with large draughts of hot water we have generally found beneficial in such cases.

CASE XVIII. *Increased Secretion and Discharge of Morbid Bile, producing Inflammatory Irritation of the Stomach and Bowels, with Headach.*

SAMUEL BIGGS, recruit, just arrived; admitted into the General Hospital 15th August, at 7 o'clock P. M. with pain and uneasiness at stomach; some vomiting and bilious purging. Sickness still continues; pulse quicker than natural; skin rather hot; tongue white.—Calomel. gr. xx. stat. V. S. $\bar{3}$ xxxij.

16th.—Much better; has taken the purging mixture; still feels uneasiness at the epigastrium and side.—Apply eighteen leeches over the abdomen. R Mist. camph. $\bar{3}$ ij.; æther. vit. \mathfrak{m} xxx.; liq. ammon. \mathfrak{m} xx. M. ft. haust. stat. cap.

Eight o'Clock.—Pulse good; pain gone; in every respect better.—R Cal. gr. xx.; opii. gr. jss.; pulv. ant. gr. iij.; syr. q. s. ft. pil. h. s. s.

17th.—Feels tightness and heaviness in his head; tongue foul and yellow; has a very bitter taste in his mouth.—Pulv. purgans stat. Apply sixteen leeches to the temples.

18th.—The leeches have relieved his head in some degree; the stools copious and bilious; the sickness and bitter taste in his mouth continue.—Mist. emetic. stat.

Nine o'Clock.—Has thrown up a great quantity of undigested food, and some very bitter dark-coloured fluid; thinks himself better, but feels weak.—Cal. gr. x. h. s. s.

19th.—Much better, but weak; has not been purged.—Mist. purgans stat.; mist. salin. febrif. cum ant. tart. gr. jss.

Nine o'Clock.—Has been purged; stools quite black and watery.—Cal. gr. x.; pulv. ant. gr. iij. h. s. Contin. mist. salin. ut antea.

20th.—Stools black and morbid; he has taken the purging mixture, which has made him sick.—Contin. mist. salin.

21st.—Stools not so black; he is much better.—Mist. amar. cum sennæ $\bar{3}$ ij. nocte manequè.

Nine o'Clock.—Feels very much better, and his stools are improving.—Contin. ut antea.

22d.—Stools more natural, and the biliary secretion seems much improved; all his complaints are removed.—Cont.

23d.—Convalescent.—Cont. haust. amar.

25th.—Discharged.

Remarks.—The circumstance of the patient having recently arrived from Europe, the pain occasioned by the acrid bile in the stomach and bowels, and the febrile symptoms proceeding therefrom, led to the adoption of general and local blood-letting. The other indications were fulfilled by the means usually employed in order to remove the disordered secretions, and sooth the irritation of the stomach and system generally.

CASE XIX. — *Copious Discharges of Morbid Bile, occasioning Disorder of the Stomach, with Determination of Blood to the Liver, &c.*

JAMES BARRETT, ætat. 27. 6th February 1820. Admitted this morning, with sickness at stomach, and occasional vomiting of bilious matter. Pain at the epigastrium; pulse firm, and pretty good; skin natural; tongue white and excited; great thirst; bowels constipated. Complaints of a week standing. Urine very high coloured, and he does not void much in quantity. Appetite pretty good.—Hab. mist. emet. statim.

Vespere.—Vomited a considerable quantity of green bilious matter, and his sickness is relieved; but he complains of the pain still at the epigastrium. Pulse soft and regular; skin cool; tongue loaded and white; great thirst; says his eyes are very dim; but he feels no pain in his head.—App. hirud. xv. reg. epigastricæ. R Hydr. submuriat. ʒj.; pulv. ipecac. gr. iij. Fiant pilul. ij. h. s. s.

7th.—Pills made him very sick in the night, and he vomited three times a quantity of green matter; but he feels no sickness at present. Tongue extremely white and loaded; three stools, and passed with some griping; considerable scalding at his seat. He cannot tell the colour of the motions.—Sumat pulv. jalap. compos. ʒj. quàm primùm. Spoon diet.

Vespere.—Stools copious, and of a dark-green colour; sickness at stomach left him; pulse firm and 90 in the minute; skin natural; tongue loaded and very white, but moist; pain at the epigastrium quite relieved.—Rep. hydr. submur. ʒj. h. s. sine pulv. ipecac.

8th.—Stools green and tenacious; feels no pain; sickness left him; tongue covered with a light yellow crust, but moist; pulse good; skin natural; urine high coloured; no appetite, and he is very thirsty.—Rep. pulv. aper. statim.

Vespere.—Stools of a dark-green watery appearance, with some dark-coloured feculent matter; have scalded him considerably in passing them. Says he feels no

pain or uneasiness in his side or belly.—Rep. pilul. ut heri, h. s. Hab. enema domesticum statim.

9th.—Six copious dark-green feculent stools, not particularly fœtid; but he complains of considerable scalding in passing them; gums sore, with some ptyalism; pulse firm, and 80 in the minute; skin natural; tongue the same.—Rep. pulv. aper. statim.

Vespere.—Stools as at last report, and still scald him in passing them; mouth sore.—R Pilul. aloët. cum calomel. no. 1. ter die. R Mist. amar. cum sennâ et sodæ tart. ℥iij. omni mane.

10th.—Stools of a brown colour this morning, and passed without any scalding; mouth more affected; tongue still loaded; pulse good; skin moist.—Contin. med.

Vespere.—Complains of pain at the scrobiculus cordis; no stool since last report; pulse rather full; skin natural.—Contin. med. et app. hirud. xv. parti dolenti. Habeat enema purgans statim.

11th.—Stools nearly natural; pain at the scrobiculus cordis considerably relieved by the leeches; but he feels some still, particularly when he takes a full inspiration.—Repet. hirud. xv. ut heri. Contin. medicamenta.

12th.—Pain relieved by the leeches; stools very dark coloured, feculent, and morbid; mouth more affected, with ptyalism; pulse good; skin natural. Cont. med.

13th.—Stools foul and fœtid. Says he feels much better. Mouth sorer; tongue extremely loaded with a white crust; pulse firm; skin natural; great thirst. Says his “inside feels very hot.” No pain about his side or stomach. Contin. medicamenta.—Repet. Pulv. jalap. compos. statim.

14th.—Mouth very sore, with copious ptyalism; three stools since last evening, of a green appearance still, and he was purged freely by his medicine yesterday; feels no uneasiness about his side or belly; tongue loaded, but moist; pulse and skin natural.—Contin. medicamenta.

15th.—No stool since last evening; mouth very sore; ptyalism free; tongue less loaded; urine continues high coloured; pulse soft and regular; skin natural.—Repet. pulv. purg. statim. Contin. alia.

16th.—Frequent copious motions from his medicine, and his stools look better; ptyalism copious. Says he is quite well, with the exception of his mouth.—Contin. medicamenta ut antea.

17th.—Evacuations of a yellow colour. Tongue still loaded, but in a less degree; mouth very sore, with copious ptyalism. In other respects he feels quite well.—Contin. medicamenta.

18th.—No complaints, with the exception of a sore mouth. Stools perfectly natural.—Omittatur pilul. Contin. haust. amar. Half diet.

19th.—Convalescent.—Contin. medicamenta, ut heri. Ut. garg. alum. sæpè.

20th.—Complains of pain and vertigo in his head; mouth very sore, with copious ptyalism; bowels open; pulse firm; skin cool; tongue less loaded.—App. hirud. vj. utrique temp. Repet. pulv. purg. ut antea statim.

21st.—Pain in his head considerably relieved by the leeches; purged freely; stools green and tenacious; mouth continues very sore, with copious ptyalism; tongue loaded with a firm crust; pulse good; skin natural; no particular thirst.—Rep. hirud. vj. utrique tempori, necnon pulv. purg. quàm primùm.

22d.—Purged freely; stools of a dark-green colour, and tenacious; headach. relieved; tongue continues loaded; pulse soft and regular; skin of a natural heat; ptyalism free; complains of thirst; appetite improving. — R Infus. amar. ℥vj.; sennæ ℥iij.; tinct. cardam. ℥ij.; sodæ sulph. ℥j. Fiat mist. sumat ℥iij. nocte manequè.

23d.—Tongue still loaded; stools of a green colour, and copious; free from pain; ptyalism continues; pulse and skin natural.—Contin. medicamenta.

24th.—Much better this morning; tongue considerably cleaner; pulse and skin natural; feels no uneasiness about his side or bowels, and his stools are pretty good this morning.—Contin. medicamenta.

25th.—Continues better in every respect; tongue cleaner.—Contin. medicamenta. After this date he rapidly recovered, and was discharged on the 28th.

Remarks.—The pain complained of at the pit of the stomach was, in this case, imputed to the irritation excited in the mucous surface of the stomach from the flow of bile into it. The leeches were applied in order to prevent the supervention of inflammation, if not already existing, or to subdue whatever may have supervened. The scalding complained of at the verge of the rectum is a frequent occurrence in cases characterised by a free discharge of morbid bile. As the copious flow of irritating bile may have proceeded from increased determination, amounting to inflammatory action in the secreting substance of the liver; and as the pain and sickness complained of still indicated the existence of inflammatory irritation of the stomach, leeches were again applied and repeated, and ptyalism produced, with a view of arresting morbid action, and changing the disordered secretion of bile. The sense of heat alluded to on the 13th seemed to proceed from the excitement produced by the flow of the stimulating secretions along the intestinal canal.

CASE XX.—*Copious Discharge of Morbid Bile, &c.*

EDWARD WILLERTON, ætat. 26, His Majesty's 69th Regiment, 19th April, 1820. Admitted this evening, with vomiting and purging. Says he vomited two large round worms this morning, with a quantity of green bitter matter, and he feels very sick at stomach still. Stools of a yellow colour, attended with considerable straining and tenesmus; tongue excited; pulse rather full, but soft and not frequent; skin cool; great thirst; appetite much impaired. Complains of some uneasiness at the scrobiculis cordis, but no particular pain.—Sumat mist. emet. stat. et hydrarg. submur. gr. xx. cum opii gr. ij. horâ somni. Spoon diet.

20th.—Vomited a considerable quantity of bile with the emetic; stools natural; tongue excited; pulse 64, soft, and regular; skin natural; complains of thirst.—Sumat mist. purg. ℥ij. statim. Sumat mist. salin. ℥jss. tertiâ quâque horâ.

Vespere.—Stools copious and dark coloured; tongue excited; pulse and skin natural; thirst urgent; passed no worms since admission.—Repet. pilul. ij. ut heri præ. h. s.

21st.—Three dark-coloured stools since last evening; sickness relieved; tongue clean, but slightly excited; pulse soft and regular; heat natural.—Repet. haust. purg. statim. Cont. mist. salin. On examining his side, he complains of some pain and uneasiness in the region of the liver, which is increased in taking a full inspiration.—App. hirud. xv. parti dolenti.

Vespere.—Medicine purged him very freely; stools morbid and bilious; pain at the epigastrium much relieved since the application of the leeches; pulse and skin natural; tongue white.—R Pilul. aloët. cum myrrhâ, ʒj.; hydr. submur. ʒss. Ft. pilulæ xx.; sumat unam ter die. R Mist. amar. cum sennæ ℥ij. bis die.

22d.—No stool since last report; says he feels a very slight pain at the ensiform cartilage, which is increased in taking a full inspiration; pulse 60, and pretty regular; skin cool; tongue clean, but slightly excited.—Cont. medicamenta, ut suprâ. App. hirud. x. parti dolenti. Habeat enema purgans.

Vespere.—Pain complained of this morning relieved by the leeches; five stools, dark coloured, with a quantity of bile and hardened fæces, and two large round worms; pulse and skin natural; tongue moist, but white.—Contin. pilul. et haust. amar. ut antea.

23d.—Seven stools since last evening, pretty copious, dark coloured, and feculent and bilious; complains of pain across the lower part of his belly; passed no more worms; pulse 54, firm, soft, but not oppressed or hard; skin natural; no particular

tension of his belly; voids his urine very well; tongue clean and very little excited; no thirst; appetite pretty good. — App. hirud. xv. abdom. parti dolenti. Cont. med. ut heri. Habeat enema purgans bis die.

Vespere. — Passed two more large lumbrici with his stools since last report. — Cont. medicamenta. Repet. enema purgans statim.

24th. — Two stools, and pretty natural; says he feels very easy this morning; tongue white and excited, but moist; no thirst; pulse calm; skin cool; tension of abdomen quite subsided; gums tender. — Cont. medicamenta.

Vespere. — Griped in the morning considerably, but he feels pretty easy at present. — Habeat enema purgans. Cont. alia.

25th. — Passed a large round worm with the injection last evening; says he is free from pain; tongue moist, but furred; pulse soft and regular; skin natural; no thirst, and his appetite is unimpaired; mouth sore, with a slight discharge of saliva. — Cont. medicamenta. Repet. enema purg. bis die. Half diet.

26th. — Complains of griping; says his stools are pretty natural; pain complained of at the ensiform cartilage relieved; tongue rather excited; pulse and skin natural. — Sumat mist. purg. ℥iij. cum ol. menthæ mīij. statim. Cont. alia.

Vespere. — Medicine purged him freely, and his stools are dark coloured; griping relieved. — Repet. pilul. et haust. ut heri.

27th. — Better this morning; passed no more worms. — Cont. med.

28th. — Mouth very sore, with ptyalism; otherwise easy. — Cont. pilul. bis die tantum. Cont. haust. amar. cum sennâ, mane, ut antea.

29th. — Mouth very sore, and he is otherwise well. — Contin. medicamenta.

30th. — Mouth sore, with ptyalism; says he feels quite easy: bowels regular, with yellow bile. — Cont. haust. amar. ut antea. Omitt. pilulæ.

Remarks. — The copious discharges of bile in this case were obviously connected with increased determination to the substance of the liver, if chronic inflammation did not actually exist. This became more apparent in the progress of the case. The morbid nature of the bile seems to have operated as an anthelminthic upon the lumbrici in the bowels. The treatment was directed with a view of discharging as quickly as possible the disordered bile, of diminishing morbid action in the organ, and restoring the healthy function of secretion. Although he continued in hospital for some days after the date of the last report given at this place, he continued rapidly to recover.

CASE XXI.—*Copious Discharges of Acrid Bile, producing Inflammatory Irritation of the Bowels, &c.*

J. WALLACE, ætat. 30, Madras European Regiment, 23d September: admitted this afternoon, with copious discharges of bile, producing slight dysenteric symptoms.—R Hydr. submur. ʒj.; opii puri, gr. ij. M. ft. pilul. ij. h. s. s. R Mist. purgans. ʒij. cras primò manè.

24th.—Tongue foul and excited; pulse rather full, and frequent; skin somewhat hot, and with very little moisture; pain in his head; also across the umbilicus, but not acute; straining; three stools in the night; took the purgative this morning.—App. hirud. xv. abdom. et xij. temp.

Vespere.—Pulse small and languid; seems much oppressed; tongue dry and furred; feels pain still about the umbilicus, particularly when he attempts to relieve his bowels.—Enema purgans. Cal. gr. xx.; pulv. ant. gr. iv. h. s. s. Arrow-root and wine.

25th.—One stool during the night, copious and of a green colour; pulse 72 in the minute, and firmer; skin cool and moist; tongue very foul and excited; thirsty; headach better; pain across the umbilicus relieved; complains of pain under the left breast, and rather acute; took a purgative this morning.—App. hirud. xv. parti dolenti.

Vespere.—Stools copious and dark coloured; pain complained of this morning quite relieved by the leeches; tongue cleaner; pulse 60 in a minute, and firmer; skin cool and moist; some straining, and pain at the extremity of the rectum.—Enema anod. Repet. calom. ʒj. et pulv. ant. gr. iv. h. s. App. hirud. x. os. sacro.

26th.—Stools of a dark colour and bilious; feels much better; pain at the extremity of the rectum relieved by the leeches; straining less; tongue continues loaded with a yellow fur; pulse 80, and firmer; skin natural; pain at the umbilicus and under the left breast quite relieved.—R Mist. purgans. ʒij. statim. R Mist. salin. comp. ʒij. tertiâ quâque horâ sumend.

Vespere.—Evacuations continue of a dark bilious colour; pulse and skin natural; tongue cleaner; feels much better.—Repet. hydr. submur. gr. x. h. s. Cont. mist. salin.

27th.—Stools very morbid and fœtid; feels a pain in his head; bitter taste in his mouth; tongue still rather foul and excited; pulse firmer; skin natural.—R Haust. aper. statim.

Vespere.—Headach continues, as also the bitter taste in his mouth; tongue excited.—Mist. emet. statim.

28th.—Headach relieved, as also the sickness at stomach ; vomited a good deal of green bile after the emetic ; stools of a yellow colour, but fœtid ; pulse 80, and soft ; skin natural ; tongue much cleaner, and less excited.—R Mist. purg. ℥ij. statim. Cont. mist. salin. ut antea.

Vespere.—Stools dark coloured and feculent (fœtid) ; pulse 100, and soft ; skin natural ; tongue continues foul and excited ; complains of being very sick at stomach ; says his mouth is sore, with ptyalism.—Cont. mist. salin. ut antea.

29th.—Mouth more affected ; ptyalism pretty free ; pulse 96 in the minute, and rather small ; skin natural ; tongue covered with a yellow fur ; no stool since last report.—Habeat enema purgans. Cont. med.

30th.—Had no stool since last evening ; mouth very sore, with ptyalism ; tongue loaded with a white crust ; pulse and skin natural.—R Mist. purg. ℥ij. ; ol. menth. miiij. M. ft. haust. statim sumend. Cont. mist. salin. ut antea. Haust. amar. cum sennâ, ℥ij. bis die.

From this time he rapidly recovered.

Remarks.—The acrid and stimulating properties of the bile in this case had evidently occasioned much inflammatory action in the mucous surface of the alimentary canal ; and if the disorder had not been arrested speedily by the treatment, complete dysentery, complicated with disordered biliary secretion, would have been the consequence. The leeches applied to the umbilicus and sacrum were directed with a view of subduing whatever inflammatory excitement might have taken place in the mucous surface of the small intestines, colon, and rectum. Numerous cases, in every way similar to the above, are recorded in the diaries of the General Hospital at Madras, and of the Hospital of the Madras European Regiment.

The irruption of bile into the alimentary canal, after having been long retained in the liver and gall-bladder, is also frequently productive of much constitutional commotion, and of a still more formidable kind, than that which has been evinced in the foregoing cases. But this subject will be more appropriately considered hereafter.

SECTION II.

Of the Treatment of an Increased Secretion of Bile.

It will be perceived, from what has been advanced in the preceding observations, that we consider the thick and rich blood of Europeans, loaded as it is with an excess of those materials or elements of which bile is composed, to be the immediate and principal cause of hepatic disorders amongst them; and that this state of the circulation prevails in consequence of a diminished change being effected upon the blood by respiration, compared with that which it undergoes in cold or temperate climates, and of the copious supply of these elements conveyed into it from the mode of living followed by Europeans residing in warm countries. It follows from this, that in order to procure exemption from those ailments, the European visiter or residenter in a warm climate should conform his diet and regimen so as to moderate or diminish the excessive supply of chyle, and should live principally upon those articles which, while they convey sufficient nourishment to the body, contain but little of those elements of which bile is constituted. The observations which have been already offered upon the subject of diet, and the mode of living there recommended, if at all closely followed, will prove as beneficial in this point of view as any thing that may be further advanced upon the subject. In order, therefore, to avoid repetition, we refer our readers to the remarks already offered.* As the experiments of the physiologists we have alluded to shew that the changes effected by respiration upon the blood are diminished by whatever tends, directly or indirectly, to lower the powers of life, such influences, causes, and feelings, which have this effect, ought to be avoided as far as circumstances may permit. And this should be the more closely attended to, inasmuch as experience shews that the very same causes, which have been proved by experiment to diminish the influence of respiration upon the blood, act in a proportionate degree

* See pp. 100 and 192, *et seq.*

to increase the biliary secretion,—a strong evidence in favour of the views already argued for.

As we have every reason to believe that when bile is secreted in an excessive manner it often possesses also more acrid and stimulating qualities, particularly if it have been retained for any time in the gall-bladder and biliary ducts, we would, therefore, recommend both the practitioner and the patient himself to endeavour to dilute it, and thus to render it less irritating during the time that it is being carried out of the system; at the same time that the attention of both should be directed to guard the mucous lining of the intestinal canal from the injury it is apt to experience from the flow of a highly stimulating fluid along it, and particularly from its retention in any particular part of the canal. For this purpose, ipecacuanha emetics are useful when there is no determination of blood to the head, or any particular irritability of stomach to contraindicate their employment. Emetics ought to be followed by copious draughts of weak tea or of warm water; and afterwards, emollient draughts, with the sub-carbonate of soda, effervescent draughts, &c., may be given with advantage. The practitioner will frequently find his patients, who labour under the evil of an increased secretion of bile, or with that of accumulations of acrid bile let loose upon the intestinal canal, complaining of scalding at the rectum, and even of excoriation in the same situation, in consequence of the effects produced by the irritating nature of the secretion while passing over a sensible part of the canal. This should always warn the practitioner of the qualities of the secretions poured into the intestines, and should point out to him the necessity of diluting and rendering less irritating these fluids, at the same time that he endeavours to rid the system of them. In such circumstances, amylaceous and other emollient enemas, thrown up with considerable force, will prove most serviceable; and laxatives of a cooling nature, such as the supertartrate and tartrate of potass, will always be given with advantage.

When, however, we find that the disordered biliary secretion is impeded in its course downwards, more active measures will generally be required to bring it away with the requisite celerity; for if it be allowed to stagnate

in any particular part of the tube, serious disorder may be induced by it in the mucous tunic of the part. In such a case, the purging powder, the purging mixture, the bitter aperient mixture, calomel, castor oil, or any of the purgatives prescribed in the above cases, will answer the purpose sufficiently well.

It very frequently happens, that during an increased flow of bile, the mucous surface of the intestinal canal, and even of the stomach, when the bile regurgitates into this viscus, suffers considerable irritation, even amounting to inflammatory action, from its irritating properties. In such case, the patient generally complains of pain, either in the situation of the duodenum, in the stomach, or in the intestines. When this is observed, the application of leeches should always be resorted to, in addition to the other means already noticed. We are convinced that the pain and uneasiness produced in the duodenum, in consequence of the inordinate flow of an irritating bile into this viscus, is, owing to the situation of the parts, often mistaken for pain and inflammation of the liver itself. This is, however, a matter of subordinate consequence in a curative point of view; for the treatment suitable in the one case is by no means inappropriate in the other. In a diagnostic point of view, it is otherwise; and yet, in a warm climate more particularly, it is almost impossible to distinguish between the one and the other. It is true, the experienced observer may often, from a concurrence of circumstances, draw a very correct idea in his own mind of the exact form of disorder. But if he attempt in this, as in many other cases, to convey a notion of the grounds on which he has usually founded his opinion, and to describe the symptoms by which he has been assisted in his diagnosis, he will as often mislead as instruct his reader.

SECTION III.

Of Congestion, or Accumulation of Bile in the Gall-Bladder or Biliary Ducts.

THIS appears to us to be one of the most important derangements of function to which the biliary apparatus is liable in a warm climate. It may appear as the only cause of disorder, or it may be complicated with other derangements, if not actually producing them. As respects its origin and progress, it appears to be very intimately related with an increased secretion of bile: indeed, such increase, to a greater or less extent, seems to be materially necessary to its occurrence.

During our practice in India, we have had numerous opportunities of observing, in the *post mortem* inspection of those who had died of diseases either immediately seated in the liver, or affecting other organs, the gall-bladder distended with a thick, viscid, and acrid bile, and the ducts running from the secreting granulae of the liver through its substance to their principal trunk, completely gorged with bile of nearly similar characters. In different cases, indeed, this secretion presented different appearances, as regards colour and consistence; but the engorgement of the ducts and gall-bladder was generally remarkable, without any apparent organic change sufficient to account for the circumstance. In the majority of instances, the outlet of the ducts in the duodenum was quite free, and their channels unobstructed, unless the viscidness of the secretion may be viewed as an impediment,*—an inference that seems by no means irrational. Where any obstacle existed, such as

* We have frequently seen, upon the examination of bodies which had died of different diseases, the gall-bladder loaded with bile of a dark-green colour, and so thick and viscid that it could scarcely be forced through the ducts by squeezing the gall-bladder, although a blow-pipe or probe would pass readily along them, shewing that the obstruction was then owing to viscidness alone. Doubtless, spasm, or other more permanent obstruction, will frequently arise, as we shall have occasion to shew in the sequel.

narrowing of the ducts, the impaction of calculi in them, or the existence of spasm,—the cause was then evident; but in the absence of all these, the only conclusion we could form as to the cause of this very frequent appearance, was, that the secreting functions of the liver may be so modified in a warm climate, that, in addition to an increase of the biliary secretion, this fluid itself may be retained and accumulated in those parts of the apparatus which admit of the retention. Attentive observation of the phenomena, marking the origin and progress of the diseases of the liver and bowels, and of the various types of fever, has further confirmed our opinion as to this particular point, and convinced us that this state of function actually obtains, at the commencement and during the progress of these disorders, more frequently than is supposed, and is actually oftener present at these periods of ailment than in the last or fatal stage of disease; and that it is not only met with as a symptom or concurrent phenomenon in these disorders, but as an ailment *sui generis*, the disturbance observed in the system being the result of this cause, or arising from the irruption of the long-retained bile into the alimentary canal.

During an increased secretion of bile, if any momentary impediment come in the way of the flow of this fluid, either in the course of the common duct, or at its outlet, a copious regurgitation of it into the gall-bladder, and accumulation of it in the biliary ducts, must be the consequence; and if the obstacle placed in the way be either partial or complete, or of short or long duration, the accumulation will be in proportion to its extent and duration, and the copiousness of secretion. If the secretion be going forward abundantly, an obstacle, partial in its operation and of short continuance, will give rise to a great accumulation in the gall-bladder, and in the liver itself. If the secretion be natural, or even less than natural, a more complete or long-continued impediment opposing its discharge into the duodenum will have a similar effect. Thus, in recruits and other strangers to the climate, on their arrival in India, when the biliary secretion is much increased, the temporary obstruction produced by exposure to currents of cool air, to wet, and by eating indigestible and hurtful substances, &c. often occasion the most formidable symptoms of disease, and when the obstruction is overcome, an immense quantity of vitiated bile is passed. On the other hand, temperate persons, of regular habits and good conduct, are

not so liable to these kinds of derangements, and suffer less severely from them when they occur. It is also reasonable to suppose, if the gall-bladder and ducts be over-distended with the accumulation of bile within them, that their vital contractility may be weakened, and that they will be the less able to re-act upon the distending power; and thus the evil will be increased, until that degree of constitutional disturbance be excited by the morbid distension, or until some internal or external cause supervene, which shall enable the organ to throw off the load which oppresses it, and discharge its morbid secretions.

The obstructions which generally occasion accumulation of bile in the apparatus concerned in its secretion and discharge, seem to be whatever suddenly diminishes the vital influence of the organ or the system generally; as exposure to terrestrial and morbid exhalations, sudden chills, the depressing passions, the use of cold fluids and ices when the skin is perspiring, &c. Spasm of the common ducts may arise from these and other causes, and produce more completely the same effect. A weakened state of the digestive organs, particularly of the duodenum and stomach, may also be productive of accumulation of bile, by furnishing a copious supply of ill-digested chyle, abounding with the elements whence bile is formed; while, at the same time, the debility which these viscera experience extends itself to the gall-ducts and bladder; and the emulgent operation, usually produced by a healthy and active function of the duodenum, no longer takes place, or, if at all, in a lesser degree. The accumulation of mucus on the internal surface of the duodenum may also obstruct the mouth of the common duct, and prevent the flow of bile into the alimentary canal, until this obstruction be either overcome or removed.*

With respect to the signs by which accumulations of bile in the gall-bladder or biliary ducts are to be recognised, we may observe, that, although they may be trusted in on many occasions, they are not always uniform;

* See, on this subject, the observations and experiments contained at p. 398 *et seq.* of "Sketches of the Diseases of India," &c.

nor, taken singly, can much reliance be placed upon them. However, when viewed in connexion, and duly estimated by the discriminating judgment of an experienced practitioner, they may be considered as conclusive as the signs which mark any other functional disorder: nice discrimination, however, is necessary to the discovery of these more obscure biliary derangements. Many of the symptoms by which they are indicated are not generally of such apparent urgency as to alarm the patient, and cause him to apply for medical aid, until further disorder be produced, or until the accumulated bile has made its way into the duodenum, and, from its irritating qualities, caused disorder of the alimentary canal, and serious constitutional commotion. The earliest symptoms of which the patient generally complains, when he attends to his sensations and state of health, are, clamminess and foulness of the mouth, fauces, and tongue, with a bitter taste, particularly in the morning; a sense of distension and weight at the epigastric region and at the præcordia; frequently with a sense of coldness and sinking in the same situations; slight anxiety; acid and acrid eructations about three or four hours after a full meal, with painful fulness at the epigastrium, and difficult digestion. The patient often complains of headach, pain in the back or loins, uneasiness under the shoulder-blades, fulness and pain in the region of the liver, particularly when pressure is made at the time of his taking a full inspiration; and of aching in his knees, shoulders, and limbs; his countenance being pale, sallow, or muddy, and the conjunctivæ more or less tinged of a yellowish hue. The state of the pulse is different in different cases. It is often slow and full, and sometimes it is irregular in frequency and strength; occasionally it intermits, and not infrequently becomes quick, but oppressed upon the least motion or exertion. The urine is generally high coloured, and depositing a brownish sediment. The stools are often costive, sometimes light or clay-coloured, and frequently tenacious. When the accumulated bile is discharged into the alimentary canal, much constitutional disturbance then generally arises, according to the qualities which this fluid may have acquired from its retention. The pulse now becomes quick, and often irregular; vomiting and purging, with griping, pain, and anxiety, often supervene, sometimes with spasms. Thirst becomes urgent, and the tongue, which was before foul, is now excited, often dry, and its papillæ large, distinct, and erect.

When only two or three of the above symptoms are present, or when they are slight, the patient seldom seeks relief until an aggravation of the ailment takes place, or until the pent-up bile creates more alarming disturbance from its irruption and sudden flow into the duodenum. On such occasions, the constitutional disturbance is often violent, owing to the mucous connexions of the duodenum with the other parts of the animal œconomy. The particular effects produced by the bile, when thus let loose upon the sensible mucous surface, will vary, as we have already stated, according to the properties which it may have possessed originally, or may have acquired during its remora in the gall-bladder and ducts; and according to the habit, strength, age, and temperament of the patient, and the condition of the mucous surface of the alimentary canal at the time. As these circumstances, and the relations of one to the other, vary, so will the particular kind of disorder produced therefrom differ in character: it may assume the form of simple bilious diarrhœa, terminating in a few hours, or running on for several days; it may be bilious or sporadic cholera; it may even occasion simple dysentery, or inflammation of the mucous surfaces over which the disordered secretion passes, or upon which it is for a time retained. On many occasions it will produce vomiting, and on others inflammatory action of the internal surface of the stomach. But in this latter case there will also be more or less of the same action produced by it in the duodenum and inferior portions of the alimentary canal. Sometimes the inflammation will be confined to the duodenum itself; but this is, in our opinion, a comparatively rare occurrence. A case of this kind was verified by the appearances on dissection.

A female, leading an irregular life, came into hospital complaining of all the symptoms of bilious accumulations of a morbid character, with much debility, a broken-down constitution, quick, feeble, and fluttering pulse, nausea, and vomiting of dark-green bilious matters, slight purging of dark bilious and fluid motions, coldness of the surface, sunken countenance, and pain and anxiety at the pit of the stomach and right side. Blisters were applied to the epigastrium; laxatives with ammonia were given internally, and enemas of an aperient and cordial kind thrown up. She died soon after admission, and the body was inspected within twelve hours after death. Upon examining the ali-

mentary canal from the œsophagus to the rectum, and exposing its internal surface throughout, the duodenum was found highly inflamed from the pylorus to the jejunum, the upper portion of which latter was also inflamed. A part of the duodenum, a little below the entrance of the ducts, was spha-celated. A few red points were observed in the stomach and other parts of the alimentary canal; but these were not more numerous or extensive than what are often remarked in cases of death from diseases in which the functions of the alimentary canal were unaffected. The portal veins were turgid; the liver somewhat enlarged. There was no other morbid appearance.

It sometimes occurs that the inordinate flow of morbid bile into the duodenum, particularly when it has been long retained, and during close, warm, and moist states of the air, occasions great faintness, the most alarming state of sinking, and prostration of the vital energies. This is more particularly marked in the nervous and melancholic temperaments, and debilitated habits. On the other hand, when the secretion possesses irritating qualities, and when it passes into the digestive canal in too great abundance, in individuals endowed with the sanguine and irritable temperaments, and full or robust constitution, much febrile excitement frequently follows, particularly if the mucous surface of the duodenum and small intestines be less than usually protected by its secretions.

In those cases where the natural functions of the bowels have been impeded by accumulations of viscid and tenacious matter adhering to them, the irruption of morbid bile is productive of much less violent constitutional disturbance, and is even beneficial, inasmuch as it detaches, as we have shewn in our Sketches of the Diseases of India, this matter from the mucous surface, and leaves it free and unencumbered in the performance of its functions. It should, however, be remembered, that the impeded flow of bile which often precedes and accompanies the congestion of it in the gall-bladder and ducts, is often the cause of an inordinate accumulation of mucus on the internal surface of the bowels, the discharge of bile being insufficient,

under these circumstances, to produce the necessary effects upon the mucus, and to detach it from the surfaces to which it so firmly adheres.

Besides occurring as a primary disorder, accumulation of bile is often met with in intertropical practice, as a symptom of other more dangerous and severe diseases. As it thus occurs, it will be noticed under its appropriate head; and the complications of diseases, of which it occasionally forms a part, will also be brought under consideration in the sequel. We now proceed to detail cases in which the chief causes of disorder seemed to us to be accumulations of bile in the biliary apparatus, or the inordinate flow of it into the alimentary canal: we shall afterwards record a few instances, illustrative of the different effects which such accumulations and irruptions of bile produce, short of occasioning those more formidable diseases which frequently result from this cause, and which will be discussed in a future part of the work.

CASE XXII.—*Copious Flow of, and great Accumulation of Bile.*

THOMAS YOUNG, M. E. Regiment, ætat. 41; a very hard drinker, and has been very lately intoxicated before his admission. Admitted 17th Feb. 1817, at Karnoul, when in camp. Took a purging powder this morning.

Vespere.—Has been purged; motions crude and offensive.—Calomel. gr. xij. h. s. s.

18th.—The quantity of pure dark-green cystic bile which has been discharged from his bowels is incredible; it was the same as if it had been squeezed out of the gall-bladder; he was very much griped before he passed these stools, but was relieved immediately afterwards; his tongue is excited and dry; skin moist, and natural heat.—Mist. purgans. ℥ij. ; mag. vitriol. ℥ss. stat. Cap. mist. salin. feb. et vin. ant.

Vespere.—Stools more feculent, but still bilious.—Cal. gr. xij.

19th.—Stools the same as yesterday morning, consisting of pure green bile; tongue cleaner; pulse good; no pain or straining.—Ol. ricin. ℥ij. stat. Cont. mist. salin.

Vespere.—Much better; stools natural and feculent.—Rep. calomel.

20th.—Stools feculent and green, but there is no straining.—Mist. purgans.

Vespere. — Stools perfectly natural. — *Haustûs amari*, cum sennâ, \bar{z} ij. nocte manequē.

21st. — Feels quite well ; stools quite natural. — *Ol. ricin.*

22d. — Recovered and discharged.

Remarks. — Although the accumulation of bile on the biliary organs, and its flow into the alimentary canal, were most abundant in this case, yet but little comparative derangement was occasioned in the system,—a circumstance to be attributed chiefly to some peculiarity in the state of the secretion, or in that of the patient's constitution, and, perhaps, to the state of the alimentary canal at the time.

CASE XXIII. — *Accumulations of Bile, producing irritation of the digestive mucous Surface and constitutional disturbance.*

JAMES SMITH, ætat. 28, late arrival, admitted in the evening of 17th July, 1819; complains of sickness of stomach and cramps, with bitter taste of the mouth; stools frequent, watery, and bilious; tongue white and moist; pulse small, irritable, and weak. — *Mist. emetic*; afterwards *calomel. gr. x.*; *opii, gr. j. h. s. s.*

12th. — Vomited a great deal of green viscid bile; he is not so sick this morning, but still complains of pain in the epigastric region, and a sense of fulness and oppression; he feels weak and faintish occasionally; pulse small, but firm; stools copious and bilious. — Apply twelve leeches to the *scrob. cordis* immediately. *Mist. purgan. \bar{z} ij. stat.*

Vespere. — Pain quite relieved by the leeches; has been purged; stools watery, and of a dark-brown colour, mixed with little black seeds. — *Cal. gr. xij.*

13th. — Feels much better; stools green, copious, and watery. — *Pulv. purgans.*

Vespere. — Stools dark green, viscid, and tenacious; he is much better. — *Cal. gr. xij.*

14th. — No pain at all; stools bilious and morbid. — *Pulv. purgans.*

Vespere. — Stools dark green, feculent, and copious; he feels quite well. — *Rep. cal. gr. xij.*

15th. — No stools; says he is well. — *Mist. purgan. \bar{z} ij.*

Vespere. — Stools still green, but much better. — *Calomel. gr. xij.*

16th. — Stools more natural; no complaint. — *Mist. purgans.*

Vespere. — Well purged; stools quite natural. — No med.

17th. — *Rep. mist. purgans.* — Motions perfectly good.

18th. — Discharged.

Remarks. — The more urgent symptoms in this case were entirely the result of accumulation of morbid bile on the biliary organs, and the discharge of it into the alimentary canal, — all disorder ceasing as soon as the cause was removed. The propriety of continuing the purgatives until the stools assumed a healthy appearance was evinced in this case.

CASE XXIV. — *Accumulation of Bile, creating constitutional disorder.*

PATRICK MARTIN, private, M. E. Regiment, admitted 17th November, 1815, at Karnoul, after a march, and where there were great facilities of drinking. Complains of weight and oppression at stomach, and great pain in the scrob. cordis, and on the left side; makes his urine very well; bowels regular; had a cold fit before he came into the hospital; pulse quick and hurried; breathing rapid; skin hot and dry; bitter taste in his mouth. — Mist. emetic. stat. Haust. anodyn. h. s. s.

18th. — The vomit operated very well, and he threw up some green bitter bilious matter, which relieved the oppression and sickness at stomach immediately; pulse good, but rather quick. — Mist. purgan. \mathfrak{z} ij. stat.

Vespere. — Much better; stools copious and feculent, of an olive-green colour. Will not take medicine; says he is well.

19th. — Says he is able to do his duty; and as he will not take medicine, he was discharged; but he returned again in the evening, with considerable fever, dry tongue, great oppression, and general soreness over his belly; pulse frequent, 120, and full; skin moist and warm: he is rather an unruly patient. — Calomel. gr. xij. h. s. R Mist. salin. feb. ℥j.; vin. ant. \mathfrak{z} ss.; spirit. æther. nitros. \mathfrak{z} ss. M. ft. mist.; a wine-glassful every hour.

20th. — Skin dry, but with a greasy feel; tongue moister and cleaner; says he is much better this morning; headach continues; pulse 102, and small; feels soreness across his belly; two natural motions this morning. — Mist. purgan. \mathfrak{z} ij. stat. Cont. mist. salin.

Vespere. — Fully purged; stools a light-brown colour; much better. — Cont. mist. salin.

21st. — Feels exceedingly weak, and has no pain or fever; bowels regular; tongue clean. — Pulv. cinchon. \mathfrak{z} j. ter in die.

Vespere. — He had a severe attack of fever after we saw him this morning, and has vomited a great quantity of green bile; his skin is now cool, but it is dry; tongue quite clean and moist. — Cal. gr. xij.

22d.—Passed an easy night, though he did not sleep; his tongue continues clean and moist; pulse 72.—Ol. ricin. ℥ij.

Vespere.—Stools a light-orange colour, and copious; he is free from fever.—Cal. gr. xij.

23d.—Much better this morning; had one stool; no fever.—Ol. ricin. ℥ij.

Vespere.—Purged five or six times; stools crude and feculent, with a considerable quantity of hardened lumps of fæces, and some orange-coloured bilious matter. He is better.—Cal. gr. xij.

24th.—Much better; no fever.—Ol. ricini.

Vespere.—Motions perfectly natural, and he is quite well.—No med.

25th.—Perfectly well. —Ol. ricini.

26th.—Discharged.

Remarks.—The symptoms referable to the stomach, and afterwards to the bowels, in this case were clearly attributable to the morbid accumulation of bile, and its retention in the primæ viæ. The treatment was directed accordingly, and will illustrate the curative precepts which we have given with regard to this form of derangement.

CASE XXV.—*The Retention of Disordered Biliary Secretions, producing Headach and Febrile Disorder.*

N. EGAN, ætat. 36, 6th October, 8 P.M.: admitted this evening, with headach, constipation, and foul tongue.—R Hydr. submur. ʒj. : pulv. ant. gr. jv. M. ft. pilul. ij. h. s. s. R Pulv. jalap. com. ʒj. cras primò mane.

7th.—Complains of pain in his head; pulse 70 in a minute, and pretty regular; skin natural; tongue white and excited; five stools from his medicine last evening, bilious and copious.—App. hirud. xij. temp. Habeat enema purgans.

Vespere.—Pain in his head relieved by the leeches; tongue white and excited; purged freely; stools of a green colour; pulse as at last report; skin cool and moist.—R Hydr. submur. gr. x. ; pulv. ant. gr. iij. M. ft. pilul. ij. h. s. s.

8th.—Feels considerably relieved; tongue clean, and very little excited; pulse and skin natural; one stool this morning, of a yellow colour.—R Mist. purg. ℥ij. stat.

Vespere.—Purged freely; stools dark coloured, bilious, and fœtid; head easy; skin natural; tongue white and excited; pulse rather quick.—Repet. hydr. submur. gr. x. cum ant. pulv. gr. jv. h. s. ; et haust. purg. primò mane.

9th. — Stools dark coloured and fœtid, copious and feculent; tongue pretty clean; pulse 60 in the minute, and soft; skin natural; feels quite easy. — Purgative taken.

Vespere. — Stools copious, of a yellow colour, and feculent; feels quite easy; tongue clean. — R Haust. amar. cum sennâ ℥iij. bis die.

10th. — Continues better. — Cont. med.

11th. — No complaints. Discharged the Hospital.

CASE XXVI. — *Accumulation of Morbid Bile, producing violent Headach, &c.*

SERJEANT COLLINS, ætat. 47, supernumerary, 16th April, 1829: admitted this evening, with pain in his head, and general constipation of the bowels. Pulse and skin natural; tongue considerably excited; pain in his head, chiefly across his forehead, and immediately at the back of his ears; says he has been ill, more or less, for the last two years; appetite much impaired, but he complains of no particular thirst. — R Hydr. submur. gr. xx.; opii puri, gr. j.; cons. rosæ, q. s. Ft. pilulæ duæ; horâ somni. Habeat enema purgans. App. hirud. vj. utrique tempori, et xij. nuchæ. Spoon diet.

17th. — One stool from the enema, and formed, of a dark colour; head much relieved by the leeches; tongue foul; pulse 90 in the minute, firm and soft, but not full; skin of a natural heat. He took ℥ij. of the mist. purg. early this morning, which he vomited immediately, and he felt rather sick in the night from his pills, but he had no vomiting. — R Mist. purg. ℥ij.; infus. gentian. com. ℥j.; ol. menth. ℥iij. M. ft. haust. statim sumend. R Mist. salin. compos. ℥jss. tertiâ quâque horâ. Habeat enema purgans ter die. Spoon diet.

Vespere. — Frequent, copious, dark-coloured, and fœtid stools from his medicine; pain in his head much relieved by the application of the leeches, but he complains still of the pain towards the back part of his head; pulse calm; skin cool; tongue furred. — Repet. hirud. x. parti dolenti. Repet. pilul. ut heri, horâ somni. Cont. mist. salin.

18th. — No stool; head considerably relieved; pulse soft and calm; heat natural; tongue excited; no thirst; and he feels altogether better. — Repet. haust. purg. statim. ut heri præ. Cont. mist. salin.

Vespere. — Vomited a great quantity of green bilious matter since last report; purged freely: his stools are extremely offensive, bilious, and morbid; skin cool and moist; tongue excited. — R Pilul. aloët. cum calom. no. 1. ter die. R Mist. amar. cum sennâ ℥iij. nocte maneque. Sago diet.

Nocte. — This moment vomited a quantity of bright green bile, which is extremely bitter, and he feels very sick at stomach. — Capiat mist. emet. statim.

19th. — Vomited a great quantity of bilious matter after the emetic, and he feels much relieved; no stool since last evening; head quite easy; tongue less excited; pulse 84, firm, soft, and regular; skin cool and moist; passed a good night. — Cont. med.

Vespere. — Stools *extremely offensive*, and dark coloured: gums tender; perspired a good deal all day; says he feels much easier altogether. — Cont. med. Habeat enema purg. vesp.

20th. — Two bilious stools since last evening, and less offensive; tongue furred; skin cool; pulse regular; no particular thirst; head relieved; appetite improving; mouth very sore, with ptyalism. — Cont. med.

Vespere. — Two copious bilious stools since morning, and he feels easy. — Cont. medicamenta.

21st. — Stools improved this morning, and he feels better; ptyalism free. — Cont. medicamenta.

Vespere. — Two stools since last report, of a brown appearance; mouth very sore, with ptyalism. — Omitt. pilul. Cont. alia.

22d. — Continues easy, with the exception of a sore mouth; no stool since last evening; appetite good. — Contin. mist. amar. cum sennâ, ut antea. Half diet.

23d. — Bowels rather costive; otherwise better; ptyalism copious. — Sumat haust. purg. stat. Cont. alia.

24th. — Complained last evening of slight return of pain in his head, when he was ordered ten grains of calomel; says he perspired considerably all night, and his head is quite relieved this morning; pulse calm; skin natural; tongue loaded; ptyalism pretty free; says he thinks his diet yesterday occasioned his headach. — Sumat mist. purg. ʒiij . statim. Cont. alia. Some sago, with a very small quantity of wine in it, for his dinner.

25th. — Medicine purged him freely; head perfectly relieved; mouth very sore, with ptyalism; pulse calm; tongue loaded; skin cool and moist. — Repet. haust. purg. statim. Utatur garg. com. sæpè. Habeat pro potu acid. nitr. ad libitum.

26th. — Complains of a sense of coldness in the calves of his legs, and arms; pulse calm; tongue loaded; mouth better; no stool since last evening. Took the following at bed-time last night, and he felt very comfortable all night. — R Tinct. opii, mxxx .; spt. æth. nitr.; vin. ant. āā ʒss .; mist. camph. ʒjss . M. ft. haust. Cont. garg. et potus acidus. R Decoct. cinch. ʒjss .; tinct. ejusd. ʒjss .; acid. sulph. dilut. mxx . M. ft. haust. ter die sumend. Cont. haust. amar. cum sennâ, omni mane.

27th. — Passed a good night; ptyalism copious; no return of the coldness complained of yesterday morning; no stool. Cont. omnia.

28th. — Bowels rather constipated ; otherwise better. — Sumat haust. purg. statim.
Cont. alia.

29th. — Bowels freely open. Quite well.

30th. — Discharged.

Remarks. — The morbid accumulation of bile in this case was excessively great. The pain in the head was evidently dependent upon this cause. The affection of the mouth by the mercury was carried its due length in this case, particularly as the man had evidently been suffering long under disordered function of the liver and digestive organs ; and the presumption was, that some morbid change of the substance of the liver may have supervened, although there was no evident sign of it. The case illustrates well the utility of the treatment we have recommended in the section upon the method of cure.

CASE XXVII. — *Retention and Accumulation of Bile, occasioning Febrile Disorder, Headach, &c.*

— BARRETT, admitted 26th June, 1819.

July 1, 1819. — Has had pain in the breast, at the pit of the stomach, with uneasiness in the side and back, slight fever and pale stools, apparently from some obstruction to the free discharge of bile. Has taken emetics ; leeches and blisters have been applied ; and the saline mixture, with ant. tartar., has been prescribed. This morning he says he is better ; has been purged, and the stools have now become dark and greenish black ; tongue cleaner, but still yellow : pulse small, oppressed, and 104 in a minute. — Mist. purgans. ℥ij. Pil. aloës cum cal. three times a day. Mist. salin. febrif. cum ant. tart.

Evening. — Well purged ; stools black ; feels better at the scrobiculus cordis, but has severe pain in his head. — Apply six leeches to each temple.

2d. — Head much relieved by the leeches ; stomach better ; but tongue very foul and yellow ; stools black, as usual. — Mist. purgans. ℥ij. Mist. salin. febrif. cum ant. tart. Cont. pil. aloës ut antea.

Vespere. — Stools continue dark coloured ; complains of slight vertigo. — R Hydr. subm. gr. x. ; pulv. antim. gr. iv. ; cons. rosæ, q. s. fiant pil. duæ : horâ somni sumendæ. Repet. haust. aper. cras primò mane.

3d. — Tongue still loaded, and peculiarly yellow ; feels much better ; has not been purged yet. — Repet. mist. purgans. Cont. mist. salin. et pil. ut antea.

Evening. — Pulse 120 ; stools continue dark coloured ; slight febrile symptoms this afternoon. Says he feels no pain in the hepatic region. — R Calomel. gr. x. ;

antim. tart. gr. ss. M. ft. pil. h. s. Habeat balneum tepidum vesper. Cont. alia ut antea.

4th. — Pulse quick, sharp, and rather hard; tongue the same; skin warm; had no stool in the night; has pain in his head at times; face flushed. — Mist. purgans. Cont. ut antea.

5th. — The blister has ulcerated; his tongue is cleaner; his mouth is slightly affected; stools more copious, and still black; pulse 72; skin cool and natural. — Apply a poultice over the ulcerated blister. Cont. mist. salin. et pil. aloës ut antea. Mist. purgans. \bar{z} ij.

Vespere. — Only one motion from the medicine this morning; feels easy, with the exception of the blister. — Habeat enema purgans statim. Cont. omnia ut antea.

6th. — Mouth sore; tongue moist, and has lost the clay-yellow appearance; the uneasiness at the scrobiculus cordis gone; bowels free; stools black and bilious. — Mist. purgans. Cont. pil. ut antea. Continue poultice, and sprinkle it with a little bark.

7th. — Mouth much affected; stools highly bilious, with lumps of inspissated bilious matter, of a very dark colour; pulse good; skin natural. — Omit. pil. Cont. purgans. et mist. salin. ut antea.

8th. — No pain nor oppression at the scrobiculus cordis; pulse natural; skin cool; mouth excessively sore, and considerable ptyalism; stools black, as usual, but feculent. — Garga. alum. Mist. purgans. Cont. mist. salin.

9th. — Pulse 84; blistered part is better; no bitter taste in his mouth; bowels not free; stools, as usual, dark and black. — Mist. purgans. \bar{z} ij. Cont. garg. Cont. mist. ut antea.

10th. — Stools still black; bitter taste in his mouth, and tongue foul; mouth very sore; considerable ptyalism. — Cont. mist. salin. et pulv. purgans.

11th. — Feels very easy; ptyalism very copious; skin natural; bowels well opened after his medicine of yesterday; urine continues high coloured. — Cont. haust. salin. ut antea.

12th. — Continues better; pulse and skin natural; no stool since last report. — Repet. pulv. jalap. c. \bar{z} j. statim. Cont. mist. salin. ut antea.

13th. — Stools yellow; no complaint but sore mouth; tongue covered with a yellow crust. — Cont.

14th. — Cont. mist. purgans.

15th. — Omit mist. salin. and give acid. nitros.

16th. — Tongue quite clean and healthy; pain and oppression are gone.

17th, 18th, and 19th. — Cont.

20th. — Mist. purgans. $\bar{\text{z}}\text{ij}$.

21st. — Mist. purgans.

22d. — Mist. purgans. Stools dark green slime.

23d. — Stools copious, and of a green colour; no pain of side; tongue still loaded.

— R Pulv. jalap. c. $\bar{\text{z}}\text{j}$. stat.

Vespere. — Voided copious evacuations, and still of a green colour. — R Hydr. subm. gr. x. h. s. s. cras mane. Repet. pulv. aper. ut antea.

24th. — No stool in the night; took his medicine as above. — Cont. acid. nitros ad libitum, ut antea.

25th. — Bowels regular; stools natural; tongue clean. — Cont.

26th. — Discharged.

Remarks. — This patient had been frequently subject to severe derangement of the biliary functions: a circumstance which materially influenced the treatment, and, with the other symptoms present, particularly the morbid state of the bile, and the frequent obstructions to its free discharge, of which he had been often complaining, indicated the propriety of mercurials, so as to produce a full effect upon the system. The advantage of the nitric acid at the stage of disorder in which it was here exhibited, and under similar circumstances of disease, has been very frequently and almost uniformly proved to us during our practice.

SECTION IV.

Of Congestion of Blood in the Liver.

CONGESTION of the blood in the liver is, in our opinion, a more frequent occurrence, both in warm and in temperate climates, than is supposed. It is present in the early stage of the majority of febrile diseases, particularly in those which are idiopathic, and is not generally overcome until after the stage of excitement has been fully formed. Congestion, existing under such circumstances, forms but a part of the general disorder of function induced by the efficient causes of fever. When thus occurring as a symptom of fevers, it will receive attention from us, when these diseases come under consi-

deration. As we conceive it, however, to form a primary disorder, and to lead to the production of other diseases, when neglected or improperly treated, we shall at this place direct that attention to it which its importance seems to us to require.

That congestion of the liver should occur frequently within the tropics cannot be a matter of surprise, after what has already been advanced respecting the disorders of the stomach, and the derangements which the secreting functions of the liver experience in those who migrate from a cold or temperate climate to that of India. The increased secretion of bile, and the frequent accumulations of it in the ducts and gall-bladder, of themselves often necessarily lead to a greater or less determination of blood to the substance of the secreting viscus. Increased secretion creates a demand for an augmented supply of blood for the purpose of secretion; and hence an active determination of this fluid to the viscus whose functions are thus excited, is a necessary consequence. Accumulations of bile in the liver itself, or in its receptacle, occasion alterations in the qualities of this fluid; and the properties it acquires, when detained for a considerable time in a high temperature, occasion a debilitating impression on the portal vessels, disposing them to congestion and passive accumulations of venous blood, which continue until circumstances supervene, either internally or externally, calculated to impart to them a power of reaction on the mass of blood, by which they are over-distended.

Whatever, directly or indirectly, diminishes the vital energy of the liver itself, or the organs more intimately related to it in function or by anatomical connexion, necessarily impairs the tonicity of the portal veins, and favours congestion in them. That they are more generally the seat of such congestion, may be inferred from the circumstance of their being placed beyond the direct current of the general circulation, and of their forming a smaller circulating system of themselves, depending entirely upon their own vitality and that of the liver for the due performance of their circulating function. Another circumstance, which also confirms this view, is, that the hepatic vein is less capacious than the vena portæ and hepatic artery, whose blood it returns. This, however, can scarcely be expected to be productive

of congestion of the portal veins under ordinary circumstances, when the vitality of the viscus is perfect in every respect, and the function of secretion proceeds in a healthy manner. But when this function is impeded, and when accumulations of bile take place in the ducts, either owing to a viscidness and inspissitude of the fluid, or obstacles placed in its way, the whole of the blood circulating in the vena portæ and hepatic artery returns, undiminished by the secreting function, into the hepatic vein; and thus congestion of the portal vessels ensues, in consequence of the passage of the blood into vessels of diminished capacity. The ingestion of large quantities of food and fluids is apt still further to promote this state, inasmuch as a part of these materials finds its way, as we have already contended,* directly into the vessels which pour their contents into the portal vein. And although such supply of new materials may not materially affect the functions of the robust individual who promotes the circulating and secreting functions of the liver by means of regular and sufficient exercise; yet it must injure the action of the organ, and load its vessels, in the weak, the dyspeptic, and the predisposed to affections of the biliary organs, and tend to the production of an increased and morbid secretion of bile, as well as to accumulations of it in the gall-bladder and ducts. The viscidness and highly venous properties of the blood circulating in the portal system likewise tend to the production of congestion, particularly when these states are but little diminished by secretion; and hence we find, that when the secreting function of the liver is impeded, or when the discharge of the bile into the duodenum is in any way obstructed, congestion is superinduced.

Too great importance cannot be attached to this condition of the vessels of the liver by the intertropical practitioner, inasmuch as we are convinced, from careful attention to the progress of disease, that it is present in the early stages of a great many diseases,—that it originates others, when neglected or improperly treated,—and that it supervenes upon, or accompanies some, during their increase or decline. We have already alluded to the existence of congestion of the liver in the commencement of all the forms and types of fever met with in warm climates; we would now particularly remark, that

* See pp. 29 and 30.

it very often gives rise to inflammations of the liver itself; congestion, various in degree, and differing as respects activity and passiveness, often terminating in inflammation of the substance of the liver or its surfaces. If the inflammation induced from this cause be seated in the surface of the liver, we shall find in the sequel that it assumes more generally an acute and decided character;—if it originates in the substance of the organ, it more frequently puts on a chronic form, and not infrequently terminates in abscess, before we have any marked symptoms by which we may be enabled to decide respecting the existence of inflammatory action.

Nor should we fail of observing, that, although increased secretion of bile, and still more frequently accumulations and retentions of this fluid upon the organs engaged in its formation and discharge, often give rise to congestion of blood in the liver,—the existence of this latter condition will, in its turn, be often productive of the former disorders of function. The state of the blood, when congested in the portal veins, is often such as favours the increased secretion of bile, particularly when the congestion is of an active kind, and unconnected with an obstructed or an impeded return of the blood through the hepatic veins, and when the functions of digestion are not materially impaired. When the congestion is of a passive kind, owing to the diminished tonicity of the vessels of the liver, accumulations of bile in the hepatic ducts is often a concomitant lesion, both derangements depending upon a similar cause, namely, impaired energy of the organ. Sometimes the accumulation of bile seems to be the effect of the venous congestion; at other times venous congestion appears to originate in the accumulated bile and the obstructions in the way of its discharge; whilst, again, the co-existence of both these states seems to result, as just mentioned, from one chief cause.

We have already alluded to the existence of congestion of the liver, during the progress and decline of other diseases. This is particularly remarkable in the history of the dysenteries of India, and in the remittents, intermittents, and continued fevers of that country, and indeed of other intertropical regions. Even in the dissection of those cases which terminate

fatally, whether from fever of whatever type, from dysentery, from cholera, either simple or epidemic, or from disorders of the other abdominal viscera, and even in those more particularly affecting the head or chest, great congestion of the vessels of the liver is not infrequently observed. Nor can the appearance be considered more the consequence of death, or of the changes immediately preceding dissolution, than previously existing disorder; for the attentive observer may often remark the signs usually characterising congestion of the liver, during the life of the patient, or may trace an obvious connexion between this condition of the viscus and the disorder of which the patient died. This subject, however, will receive from us its due attention when the other diseases, of which we propose to treat, come under consideration.

With respect to the particular anatomical characters and appearances which congestions of blood in the liver furnish, we may shortly state, that the viscus is usually much increased in size, particularly the right lobe, and that the increase in bulk takes place chiefly in the direction of the right thorax, the right lobe of the liver generally rising up into the chest, and forming a large segment of a circle, as may be observed in Plates IX., X., XIII., XVII. The colour of the organ is generally changed by the congested state, and often varies considerably, as may be seen in Plates IX., X., XIII., XIX. This difference of colour in different cases, and even in the same,* seems to depend upon the particular set of vessels, which is the seat of congestion, and to the absence or co-existence of congestion or accumulations of bile in the ramifications of the hepatic ducts. In some cases, the surface of the liver is of a darker brown than natural, almost amounting to black, greenish-black, or bottle-green, and this deep colour in some instances passes very abruptly into a reddish or light-brown tinge.† Sometimes the surface of the congested liver is variously mottled,‡ or marbled, and occasionally it is streaked and clouded, of a yellowish-brown, greenish-black, or yellowish-green hue. These shades of colour are generally more remarkable upon its upper or convex surface, but they are often observed upon the

* See Plate XVII.

† See Plate XIX.

‡ See Plate IX.

concave surface, and are quite independent of any effects which may have been produced by the bile contained in the gall-bladder. Sometimes the surface of the liver is very dark; and yet, upon cutting into its substance, the subjacent texture is of its usual colour.*

When cut into, the substance of the liver is, however, generally darker than usual, and gives out a large quantity of dark fluid blood: but in regard to fluidity, there is much difference, according to the period which has elapsed from the time of death to that of inspection. In India, where the *inspectio cadaveris* is usually made a few hours after death, the blood is observed, in cases presenting congestion of the liver, of a fluid or semi-fluid, or thick consistence, and of a very dark colour. The portal vessels and the hepatic veins are the seats of congestion, and it is often difficult to say which of the two sets of vessels presents this appearance to the greater extent, or more frequently; but we believe that the hepatic vein is more generally congested in the greater degree. In many cases, the congestion of the blood-vessels and accumulations of bile in the biliary ducts, although existing to a great extent, are insufficient to account for the very great increase of the size and weight of the liver, shewing that these appearances are often connected with augmented size of the viscus, independently of the extent to which they could have increased its bulk, and of any organic disease. On some occasions, congestion and accumulation of bile have been considerable, without any very marked augmentation of size; but more generally, congestion of the blood-vessels, particularly when associated with accumulations of bile in the biliary ducts and gall-bladder, gives rise to increased size of the liver; and such increase is often in relation to the extent to which congestion of the blood-vessels and biliary ducts obtains.

With regard to the appearances of the bile lodged in the biliary ducts, they are very various. Sometimes the bile is pale, and it is observed in different subjects deepening in shade from a straw colour to an orange, and varying from a yellowish green to a greenish black or deep bottle green.

* See Plate XVII. *fig.* 1.

When observed of the lighter shades of colour, it is generally most fluid; the darker tinges being most frequently associated with considerable consistence and viscosity of the secretion, and turgescence of the ducts. Upon making slices of the congested liver, the divided mouths of the distended ducts appear rounded or oval, according to the direction in which the division is made with respect to the axis of the duct, as may be observed in some of the accompanying Plates; and in some cases, small granular or miliary calculi are found in the ducts. In cases presenting the most fully marked appearances of congestion and biliary turgescence of the organ, the viscosity of the bile, and the infarction of it in the gall-ducts, seem to have given rise to the formation of those small calculi in the substance of the liver, and to the venous congestion with which these appearances were associated.

The bile found in the gall-bladder, in cases where congestion of the blood-vessels and turgescence of bile in the liver have been well marked, has generally been of a green colour, of every degree of shade, from a light green to a greenish black; and of every degree of consistence, from a healthy state of fluidity to a gelatinous consistence and great viscosity. The darker and more consistent appearances of this secretion, although often connected with spasmodic or more permanent obstructions in the cystic or common ducts, have been often remarked by us without any such cause; its own viscosity and consistence being the only impediment to its discharge into the duodenum.

Besides the simple appearances of disorder now described, it should be remarked, that congestion of the blood-vessels and accumulations of bile in the biliary ducts and gall-bladder often accompany, or are consequent upon inflammations of the liver, and abscesses in its substance,* as well as other organic changes; and when thus associated, will be noticed by us when those diseases come under consideration.

The symptoms marking congestion of the liver, particularly of the portal veins, are not such as can individually be depended upon. They must be

* See Plates V. VI. X. XVII. *fig.* 1, 2, &c.

viewed in connexion, and the relations and sources of each should be duly weighed before we decide upon the actual presence of a particular state of the vessels. When, however, the countenance is pale, anxious, inexpressive, sallow, of a dark or muddy hue; when the tongue is covered with whitish or yellowish-white fur, or otherwise loaded; when the bowels are costive, or when the stools are morbid, dark, and watery, with griping and tenesmus; when the digestion is difficult, attended with nausea, or when the appetite is diminished, and the patient complains of pain and oppression at the scrobiculus cordis, particularly after a meal, with flatulence, borborygmi, and oppressed breathing, and a difficulty of filling the lungs to their utmost; when the skin is cool, clammy, and foul, or of a dark muddy tinge, with irregular chills, sometimes approaching to rigors; when pain, fulness, weight, and oppression, are experienced in the region of the liver, and at the epigastrium, or across the shoulder-blades, or beneath the scapula, and have supervened suddenly; when the uneasiness in those situations is increased upon a full pressure and full inspiration; when the pulse is full, slow, and irregular, or when it is quick, but oppressed; when there is headach, restlessness, disturbed sleep, with unpleasant dreams; and when the urine is turbid, or presenting a muddy sediment,—we may infer that congestion of the vessels of the liver is actually present. It should, however, be recollected, that all, or even the greater part of these symptoms, are not present in every case; but many of them may be recognised in different grades: and it is as much by the absence of the symptoms characterising the existence of other and more serious disorders of the liver and adjoining viscera, viewed in connexion with those signs which are before us, that we judge of the actual presence of congestion, as from absolute value of the individual symptoms now enumerated. During congestion, the state of the pulse is very variable; its frequency depending as much upon the habit of body and temperament of the patient, as upon the particular state of the circulation of the liver which obtains at the time. If there have been vomiting (an occurrence by no means infrequent in this state of the organ) previously to our examining the pulse, we shall often find it quick, soft, and even full; but a quick state of the pulse accompanying the symptoms above enumerated should always lead us to dread the supervention of either general fever or of inflammation,—if, indeed, the latter state does not actually exist at the time.

With respect to pain, oppression, weight, and aching about the region of the liver, the epigastrium, and under the shoulder-blades, although also characterising inflammation of the substance of the liver, we think that they as frequently mark congestion of the organ, particularly when they supervene suddenly, and are attended with many of the symptoms already mentioned. Inflammation does not arise and advance to its acme at once, or even in a few hours; but congestion may supervene in a very short time, and, after but a brief duration, terminate in the inflammatory state. Nor can we consider the circumstance of the painful and uneasy sensations now alluded to as necessarily the result of inflammation, because they are somewhat increased by firm pressure and a full inspiration, although we should suspect this state, and act accordingly. During congestion, the liver is tumified, its surface put upon the stretch, and hence pain is produced in its coverings and substance: the diaphragm is also pressed by it against the right lobe of the lungs upon the one side, and the stomach and duodenum on the other; hence the oppression and difficulty of breathing, and the fulness and sense of distension and weight, after a meal more particularly. When the congestion, as very frequently happens, is complicated with accumulations of bile in the ducts and gall-bladder, these sensations often become very urgent, as much so, indeed, as active inflammation of the organ. If the congestion be attended with increased secretion of bile, as sometimes occurs, such increase not infrequently relieves the congested condition of the vessels, in the same manner that a moderate flow of milk relieves the congested state of the vessels of the breast, which frequently supervenes, and which, if not overcome, either in this manner or in some other, often terminates in inflammation, and the formation of abscess.

It may be proper to allude at this place to the more frequent causes of the disorders we have described in this and the foregoing sections. Besides the influence of a high temperature upon the state of the blood, as already argued for, and the liability of constitution (which all Europeans possess) to be affected with disorder of the biliary organs upon removal to an intertropical country, we conceive the habits and modes of living they generally pursue are such as to both heighten such liability, and directly produce the disease. Too much animal food and too highly-seasoned dishes, indolence and insufficient exercise

in the open air, and more particularly the inordinate use of spirituous and intoxicating liquors amongst the lower classes of Europeans, are the most powerful and frequent causes of disordered function of the liver. In addition to these may be enumerated, the influence of terrestrial exhalations and epidemic states of the air; cold and moist nights, after warm and sultry days; exposure to sudden chills, cold, or wet; neglected dyspepsia; inattention to the regularity of the bowels; and previous attacks of intermittent or remittent fevers.

We now proceed to adduce some cases of this particular functional derangement, deferring whatever remarks may be offered upon its other complications until the diseases of which it often forms a part shall come before us. As to the treatment of congestion, this important part of the subject will, with the object of avoiding repetitions, be considered in the same section with the other functional disorders to which the biliary apparatus is liable.

CASE XXVIII. — *Simple Congestion of the Liver.*

WILLIAM NICHOL, Grenadier Company, ætat. 31, admitted 24th July, 1817, evening. Complains of pain in his side, with fulness and weight; no pain in the shoulder; pulse full, not quick; skin natural. — Calom. gr. xx. Apply thirty leeches to his side.

25th. — The pain in his side, he says, is entirely gone; pulse natural; tongue clean; has been purged; stools bilious and feculent. — Pulv. purg.

Vespere. — Feels very well; bowels well purged. — Calom. gr. xij.

26th. — Pulv. purgans.

Vespere. — Feels very well. — Haust. amar. ʒj.

27th. — Discharged.

The following cases will further illustrate the characteristics of congestion of the liver, and its connexion with accumulations of morbid bile upon the biliary organs, and with disordered secretions in the alimentary canal. In some of these cases, the constitutional disturbance was heightened, as we have already shewn, by the sudden discharge of the morbid bile into the duodenum, and its escape into the stomach. In others, the congestion partook much of an active or inflammatory character, and doubtless would have soon run on to

decided inflammatory action and abscess, if it had not been speedily arrested by treatment. The connexion, indeed, existing between congestion and inflammation, is well illustrated by some of the cases, and the passage of vascular turgescence into inflammatory is shewn by them—a subject which will be considered more fully in the next chapter, when we come to treat of inflammation of the biliary organs.

CASE XXIX.—*Congestion, with Accumulation of Bile.*

JAMES BARRETT, ætat. 26, Artillery, 5th October, 7 A.M., 1817, at Kurnoul. Admitted this morning, with sickness and vomiting of bilious matter, and purging of watery stools, but he cannot tell their colour; pain at the scrobiculus cordis, and very acute; tongue white and loaded; pulse and skin natural; very thirsty; complaints came on at 5 o'clock this morning.—Capiat mist. emet. statim. App. hirud. xv. reg. epigast. primùm fomentatione utend.

Eight, A.M.—Three motions since admission, watery and bilious, but no fæces; took three doses of the emetic mixture without effect; complains of pain in his head, particularly over the orbits, and intolerance of light and dimness of sight; pulse 100, small, and somewhat oppressed; skin of a natural heat; respiration free; thirst urgent; great anxiety, but his surface is of a natural appearance.—Habeat balneum tepid. stat. App. hirud. viij. utrique temporì. Habeat enema purg. Cont. mist. emet.

Vespere.—Considerably better this evening; stools bilious, copious, feculent, and offensive; vomited a good deal of bilious matter with the emetic; pain in his head and intolerance of light relieved, but he complains of slight dimness of sight; pain at the scrobiculis cordis also relieved; pulse 90, soft, and firm; skin cool and moist; tongue very much excited, and covered with a yellow fur; thirst still urgent.—R Hydr. submur. ʒj.; pulv. ant. gr. iij. M. h. s. s. Repet. enema purgans. R Mist. salin. com. ʒij. tertiâ quâque horâ sumend.

6th.—Stools as at last report; tongue white and excited; pulse and skin natural; pain felt still at the scrobiculis cordis and umbilicus, but not very acute; no tension of abdomen; head easy; no intolerance of light this morning.—Capiat haust. purg. stat. App. hirud. xx. parti dolenti. Cont. mist. ut antea.

Vespere.—Evacuations watery, offensive, and very little or no feculent matter; no straining or tension of abdomen; pain complained of this morning at the scrobiculus cordis and umbilicus relieved by the leeches; pulse rather frequent, but soft; skin cool; tongue looks much better; thirst continues; no sickness at stomach or headach.

— Repet. pilul. ij. ut heri præ. h. s. Repet. haust. purg. primò mane. Cont. mist. salin.

7th.—Feels quite easy this morning; tongue white, with thirst; no pain felt in his belly; had no stool since last evening; no headach, but slight sickness at stomach still; pulse firm, but not full; took the purgative early this morning.—Cont. mist. salin.; enema purg. si opus sit.

Vespere.—Stools of a dark-green colour, and feculent; feels quite easy in every respect; tongue looks much better.—R Pilul. aloët. cum calom. no. 1. ter die, cum mist. amar. cum sennâ, ʒiij. nocte maneque.

8th.—Evacuations look much better, copious; pulse 90, soft; skin cool; tongue still covered with a white fur; gums tender; feels quite easy in every respect.—Cont. medicamenta.

9th.—No stool since last evening; gums tender; tongue as yesterday; pulse regular; skin cool; belly quite easy; no thirst.—Repet. pulv. purg. statim. Cont. alia.

10th.—Tongue continues loaded with a white fur; stools dark coloured and rather offensive; mouth very sore, with ptyalism; pulse good; skin natural.—Cont. med. Repet. pulv. purg. stat. Discont. pilul.

11th.—Mouth much affected, with ptyalism; tongue continues loaded with a white crust; pulse and skin natural; stools very offensive, of a dark-green colour, feculent, and *extremely copious*; complains of no pain or uneasiness in his bowels or side; head also easy; no thirst, but his appetite is impaired.—Repet. pulv. jalap. com. ʒj. statim. Cont. alia.

12th.—Purged freely by his medicine; stools continue of a dark-green colour, and copious; tongue loaded with a white crust; pulse good; skin cool; mouth very sore; feels easy.—Cont. pilul. aloët. cum calom. ter die, et haust. amar. cum sennâ, bis die.

13th.—Mouth very sore, with copious ptyalism; tongue white, but not loaded as yesterday; no stool since last report; pulse small, but regular; skin cool; no pain or thirst.—Repet. pulv. aper. statim. Cont. pilul. h. s. tantùm.

14th.—Mouth continues affected, with considerable ptyalism; feels otherwise easy; stools look better.—Cont. med.

15th.—Stools of a yellow colour, feculent, and pretty copious; tongue rather white, but clean; skin and pulse natural; appetite good; no thirst; ptyalism free.—Cont. haust. amar. cum sennâ, bis die. Half diet.

16th.—Continues better.—Cont. med. ut heri præ.

17th.—Improving fast; tongue clean and moist; ptyalism continues copious; pulse regular.—Cont. med.

18th.—As yesterday.—Cont.—19th.—Cont. med.

20th.—Continues well.—Cont. med.

21st.—Mouth is well, and feels no complaints.—Cont. haust.

22d.—No complaints. Discharged.

Remarks.—This patient had experienced several attacks of a nearly similar character to the present, which, although much resembling a seizure of sporadic cholera, yet differed from it in several essential particulars. The pain experienced at the scrobiculus cordis may have been partly owing to the irritation of morbid bile in the stomach, together with congestion of the liver and distension of the gall-bladder and ducts. The treatment was directed with a view of removing congestion and dislodging the bilious accumulations. The frequent attacks of hepatic disorder which this patient had experienced, together with the symptoms complained of at the present time, especially the morbid character of the biliary secretion, led to the full exhibition of mercury, with the intention of removing the morbid state of the organ.

CASE XXX.—*Venous Congestion of the Liver, with Accumulation of Bile.*

THOMAS JONES, ætat. 28, admitted 13th April, 1817, on the march to Hyderabad; the weather being extremely hot and oppressive. Complained, after coming to the ground, off the march, this morning, of pain in his loins.—Pulv. purg.

Vespere.—Has still pains in his loins; tongue excited; stools morbid; pulse small; slight pain in his belly.—Calom. gr. xij.; opii, gr. j.; syr. q. s. Ft. pil. h. s. s. Apply twenty-six leeches to the loins. Mist. salin. febrif.

14th.—Stools green, viscid, and feculent; has some griping; the pain in his back is no better; tongue excited; pulse slow, but hard.—Mist. purg. ℥jss.; mag. vitriol. ℥ss. M. statim capiend. Apply twenty-six leeches to the loins. Cont. mist. salin. ut antea.

Vespere.—Stools dark green; viscid mucus; pain in his back is better; feels weakness at his stomach; tongue white and excited.—Calom. gr. xx.; pulv. ant. gr. vj.; syr. q. s. Ft. pilul. h. s. s.

15th.—Much better this morning; stools green and feculent; the uneasiness in his stomach much better; tongue less excited and cleaner; pulse natural and good; skin cool and moist.—Mist. purg. ℥ij.; mag. vitriol. ℥ij. stat. Cont. mist. salin. febrif.

Vespere.—Stools dark-green colour; feels much better; tongue clean.—Calom. gr. xx. h. s. s.

16th. — Stools more feculent, still green colour ; no pain. — Pulv. purgans ; mist. salin.

Evening. — Stools more natural ; no complaint. — Calom. gr. xij. ; pulv. ant. gr. vj. h. s. s. Mist. salin. 17th. — Quite well. — Pulv. purg.

18th. — Perfectly well. — Repet. pulv. purg. 19th. — Discharged.

CASE XXXI. — *Active Congestion, with Congestion of Bile.*

JOHN SPINDLER, private, Madras European Regiment, ætat. 36, admitted 7th January, 1814. He fell out of the ranks this morning at parade, and was brought immediately to the Hospital. Has considerable fever ; foul tongue ; bitter taste in his mouth ; a quick, small pulse. — Pulv. emet. stat.

Evening. — Vomited only twice, green bitter bile ; no motion ; tongue the same ; complains of pain in the stomach ; frequent pulse. — Calom. gr. xij. statim ; pulv. purg. cras mane sumendus.

8th. — Has been purged four times ; stools hardened fæces, with a good deal of watery bile ; still complains of pain in the stomach ; pulse frequent. — Enema purg.

Eight o'Clock, A.M. — Has had four more very small, scanty motions, crude and offensive ; complains of sharp pain in the left hypochondrium, and there is some hardness immediately under the sternum. — Apply a blister and sixteen leeches.

Evening. — Has been fully purged ; stools green, like grass, and curdled : the leeches have bled well, and the blister is doing its duty ; his tongue is clean ; pulse 90, fuller and softer ; skin not hot ; pain much better. — Calom. gr. xij. h. s. s.

9th. — Has not been purged in the night ; complains a good deal of pain, but chiefly from the blister ; tongue dry, not furred ; pulse 82 in a minute ; no sickness, but he has swimming in his head. — Pulv. purg. et enema purg.

Evening. — Has been fully purged ; stools dark green, with some curdled matter ; skin cool ; pulse the same as in the morning ; tongue clean ; has some pain in the head, and bitter taste in his mouth. — Calom. gr. xij. h. s.

10th. — Tongue dry and rather excited ; pulse 84, distinct, and regular ; skin moist and cool ; pain in the side and stomach removed ; had one copious stool, of a green colour ; he feels languid this morning. — Pulv. purg. stat.

Evening. — Feels much better ; he is purged frequently ; stools green and bilious ; pulse good ; skin cool ; no pain ; bitter taste in his mouth. — No medicine.

11th. — The bitter taste in his mouth continues; he has headach; motions green; no pain. — Mist. emet. every ten minutes, till he vomit.

Evening. — Vomited fully, green bitter bile; feels infinitely better; headach and bitter taste removed; motions natural. He recovered from this time. No medicine. He was discharged, cured, on the 14th.

Remarks. — The subsidence of disorder, upon the discharge of the morbid bilious matter, in this case, shews that it was chiefly occasioned by its accumulation in the biliary organs and alimentary canal. The hardness complained of under the sternum and ensiform cartilage was evidently the result of engorgement of bile on the liver, &c. in the gall-bladder, together with vascular turgescence. The exhibition of the emetics towards the decline of the disorder was indicated by the bitter taste in his mouth, and the state of his stools. The benefit derived from them was decided.

CASE XXXII. — *Active Congestion of the Liver, with the Retention of thick morbid Bile, &c.*

CAPTAIN C——, R. N., was attacked, in the night of the 23d October, 1822, with violent and acute pain in his right side, along the margin of the ribs. I saw him on the morning of the 24th; his pulse was small and frequent; tongue foul; bowels bound; and pain exceedingly acute. — Apply fourteen leeches to the side. Give an enema purgans and ℥iij. mist. purgans immediately; ℥j. mist. salin. febrif. every three hours.

Evening. — Felt some relief from the leeches, but the pain has returned again; the medicines have had very little effect. — Apply eight leeches. Calomel. gr. x.; opii, gr. j.; syr. q. s. ft. pil. h. s. s. Repet. mist. salin. ut antea.

25th. — Pain somewhat easier; but the medicines have not had any effect upon his bowels. — Ol. ricin. ℥iij. stat. R Pil. aloë. cum myrrh. gr. iij.; pil. hydr. gr. ij.; calomel. gr. ij.; syr. q. s. ft. pilula, to be taken every three hours.

Evening. — The pain in his side has returned, and ten more leeches have been applied; he feels very low and weak. — Cont. pil. et mist. salin. febrif.

At two o'clock in the morning he was again attacked with great oppression and difficulty of breathing; pulse sharp and rapid. Warm fomentations were applied to his side, which relieved the pain, and a large blister was afterwards applied. As his bowels had been very sparingly acted upon, the following draught was given:—

R pulv. jalapæ comp. $\bar{5}j.$; aquæ menth. pip. $\bar{3}ij.$ M. This was taken at four o'clock, A.M.

26th, *Eleven o'Clock*, A.M. — The blister rose well; but there is very little effect from the medicine. — Enema purgans. Cont. pil. and saline mixture.

Evening. — Pain better; but his bowels are still torpid, and cannot be moved. — Cont. pil. et mist. salin. Repet. haust. purgans early in the morning.

27th. — No material change. The jalap had very little effect; he rejected part of it. — Cont. pil. et mist. purgans. $\bar{3}ij.$ stat. et mist. salin. Enema purgans, and fomentations to the side and whole abdomen.

Evening. — No material change. — Cont.

28th. — He is exceedingly low; no improvement; his pulse is 120; skin cold and clammy; belly tense and hard; the purgatives have no effect whatever. — Repet. enema every two or three hours. R Extr. colocynth., calomel. $\bar{a}\bar{a}$ gr. x.; ol. anisi, $\bar{m}ij.$; antim. tart. gr. $\frac{1}{4}$. ft. pil. $ij.$; one to be taken every four hours. Apply a large poultice over the whole hypochondriac and epigastric region.

Evening. — No change for the better. — Cont.

29th. — He passed a very offensive motion, of a dark green colour; pulse 112. — Cont. pil., enema, et mist. salin.

30th. — Has taken ten of the pills; passed an exceedingly offensive motion during the night; pulse reduced from 112 to 86 in a minute. — Mist. purgans. $\bar{3}ij.$ stat. Cont. pil. ut antea.

31st. — Had several offensive olive-coloured stools in the course of yesterday and last night, but they are fluid; the fulness in the region of the liver and epigastrium has entirely subsided, and the pain is less, though he thinks there was a tendency to return in the night; he breathes free; there is some fulness in the lower belly, but no tension; tongue still furred, and rather excited; has bitter taste in his mouth; pulse 84; skin natural. Has taken sixteen of the pills, or 80 grains of calomel, and 80 grains of extract of colocynth, in the last three days, and 4 grains of antim. tartarizat. He has also rubbed in over the belly six times. — R Pulv. jalapæ comp. $\bar{5}j.$; aq. menth. pip. $\bar{3}ij.$ M. This was taken about six o'clock this morning. It was rejected, with some thick, inspissated bile, of a greenish colour; and he passed several offensive, dark-coloured motions. Cont. ut antea.

Nov. 1. — The medicines continue to act upon the bowels, and his motions are quite of the same character; he is very low, and has no desire to take nourishment; but so long as these motions continue, they must be removed. — Repet. med. ut antea.

2d.—Mouth in no degree affected; but he is much improved in appearance this morning.—Omit the mercurials. Cont. mist. salin. et enema, ut antea.

3d.—Had a very copious black motion this morning, and fainted; he is exceedingly low; pulse very small; less oppression.—Cont. mist. salin. febrif., poultice and enema. These were continued till the 6th, without any alteration, the motions being dark coloured and acrid. This morning, 6th, he feels rather feverish; the skin is much warmer than usual; pulse quick; tongue foul and dry; very thirsty.—Pilul. aloë. cum calomel. &c. every four hours. R Ungt. hydr. $\bar{\text{z}}$ ss; camph. $\bar{\text{z}}$ j.; ungt. alb. $\bar{\text{z}}$ ss. M. ft. ungt.; a small quantity to be rubbed over the belly morning and evening. Cont. poultice, &c. &c. Cont. mist. salin.

7th.—He refuses to take the saline mixture. Skin continues hot and dry; pulse quick; great restlessness; tongue still foul.—Cont. pil. Enema twice a day. Mist. purgans. $\bar{\text{z}}$ ijj. cras mane sumenda.

8th.—This mixture has remained on his stomach, and procured him two very large stools of curdled and broken fæces, with large lumps of black coagulated blood. Skin hot; pulse quick, 110. He takes the saline mixture.—Repet. pil. ungt. et haust. aperiens.

9th.—Passed a much better night than usual; pulse 102; skin not so hot; has been well purged; stools broken and curdled fæces, and one dark, viscid, bilious motion. He feels much better in every respect. Tongue moist, and cleaner than it was, but still foul.—Cont. ut antea.

10th.—The medicines act now regularly, and the motions are exceedingly black, offensive, and crude, with occasional lumps of black coagulated blood. He feels better, and there is a more natural moisture on the skin.—Cont. pil. Frict. et haust. aperiens. These were continued till the 26th, with precisely the same appearances of the stools as already described. The motions now assume a different character, and are becoming much more natural; the tongue is cleaner; pulse soft, and more regular, not at all hurried, and he does not complain of any pain; his appetite is returning, and he takes food with pleasure and good appetite.—R Pil. hydr. gr. j.; pil. aloë. cum myrrh. gr. ij. ft. pil.; one, night and morning. Infus. amar. cum sennâ, $\bar{\text{z}}$ ijj. every morning. This system was continued regularly, with occasional changes, according to circumstances. He recovered, and left India in January 1823. Though his convalescence was protracted, it was regular and progressive; but he did not perfectly recover till he returned to Europe.

Remarks.—If this case had been treated in an hospital, more decisive measures

would have been adopted in the early period of the disease, and perhaps the congestive symptoms would have been sooner removed. The purgatives and other remedies were appropriate, and decidedly employed. In well-regulated hospitals in India, where there are a competent establishment of intelligent and efficient native servants, disease is minutely watched, and every change carefully noted that may have taken place between each visit; and urgent symptoms are generally counteracted so soon as they appear. This is a decided advantage, which private practitioners cannot command; and it shews the necessity of attention to the efficiency of hospital establishments, and the competence of those in whose charge they are placed;—a circumstance not undeserving the notice of the higher powers.

This is a case that ought to have been seen every three or four hours, night and day; but this was impossible, with the immense business we had to attend to. Cases, such as the present, requiring close watching and particular attention, we usually brought to our own house, where they could be well looked after, whether we were present or not: but this gentleman could not be moved.

CASE XXXIII. — *Congestion and Accumulation of Bile, productive of much Disorder, particularly of the Functions of the Heart, &c.*

— O'NEIL, of the Artillery, admitted August 17, 1819. Complains of difficulty of breathing and giddiness in the head; vomited a little; pulse quick; skin cool; tongue rather foul; belly bound. Apply six leeches to each temple, and eight to each side, *i. e.* 32. — R Calomel. gr. xx. h. s. s.

18th. — Has been purged a good deal in the night; the pain in his side is no better. He says it is not so much pain as a binding across his breast; he has some cough; pulse regular. Has taken the purgative. — Mist. salin. febrif.

19th. — Pulse quite regular, 60 in a minute; stools tenacious, of a reddish-yellow colour. He has no pain, but the tightness across the diaphragm continues as before; his tongue is tolerably clean. — Cont. mist. salin.; pil. hydr. cum calomel. nocte maneque. Mist. amar. cum sennâ, ℥ij.; mag. vit. ℥ij. M. Nocte maneque.

Evening. — Eyes peculiarly brilliant, and appear suffused; face flushed; head continues light; pulse 64. — Cont.

20th. — Passed a tolerably good night; he was not purged, and felt no particular uneasiness about his chest; pulse 60, and regular; head the same as yesterday. At four this morning, about fifteen minutes after he awoke, he was seized with what

he calls a *crushing* in his heart, which almost suffocated him ; he could not breathe for nearly two hours,—when he took the bitter mixture, which purged him freely, and relieved him at once. He has nothing of the kind now ; his sensation was a stricture on the heart, which, to his feelings, was struggling to relieve itself. If the medicine does not operate, repet. mist. ut antea.

Evening.—No material change since morning. —R Mist. camph: \bar{z} jss. ; aq. ammon. \mathfrak{m} xx. ; spr. æth. nit. \mathfrak{m} xx. ; elix. pareg. \bar{z} ss. M. ft. haust.

21st.—The draught had an effect upon him ; motions dark green ; his eyes are not so suffused as last night ; skin cool ; pulse the same ; had a slight attack, as yesterday, but it did not last more than half an hour ; his breast and side are the same ; and his head continues as before the medicine operated. Motions the same. — Cont. ut antea.

Vespere.—No alteration. — Cont. ut antea.

22d.—Pulse slow, and intermits every eight or ten strokes ; he had no oppression this morning ; head the same ; face not so much flushed ; tightness across the chest as before ; bowels regular ; complains of pain on pressing under the right hypochondriac region.—Apply sixteen leeches to the hypochondriac region, and continue the cold application to the head, and mist. salin.

Evening.—Feels no relief at all from the leeches ; has been vomiting, and threw up bile ; and has been purged ; head better since the cold application ; pulse regular, 76 in a minute, rather wiry. Cont. ut antea.

23d.—Pulse 68, regular ; head much better ; the pain in his side rather worse, he says, this morning ; tongue rather excited ; stools perfectly natural. — Apply sixteen leeches to his head, along the longitudinal sinus. Cont. ut antea. Apply a blister to the scrobiculus cordis.

24th.—Has had frequent scanty stools during the night, and complains of uneasiness at his seat ; head better ; tongue clean ; pulse and skin natural. Blister answered well. — Sumat mist. purg. \bar{z} ijj. cum ol. menth. \mathfrak{m} ij. stat. Cont. alia.

Vespere.—Stools of a dark-green colour, very fœtid and scanty, otherwise nearly the same.—R Hydrarg. submur. \mathfrak{z} j. h. s. s. Repet. mist. purg. mane.

25th.—Pulse 78 in a minute ; stools morbid and green, and very offensive ; feels no ease, he says, in the præcordia ; head is no better.—Pulv. purg.

Vespere.—Stools copious, and as at last report.—Repet. calomel. \mathfrak{z} j. h. s. et pulv. jal. comp. \bar{z} j. mane.

26th.—Stools not so dark coloured, but very fœtid ; tongue much cleaner ; pulse

and skin natural; gums tender, with slight ptyalism. Took the purgative this morning.

Vespere. — Stools as by last report, and scanty. — Repet. hydr. submur. gr. x. h. s. et mane pulv. jalap. comp. ʒj.

27th. — Feels tolerably easy; pulse regular, 78 in a minute; skin natural; says there is no alteration in his breast and head; was not purged in the night. — Pulv. purg. enema purg.

Vespere. — Stools copious, still green; pulse 90 in a minute. — Sumat pilul. hydr. cum calomel. ter die. Haust. amar. cum sennâ, ʒiij. bis die.

28th. — Had no stool during the night; mouth very sore, with ptyalism. — Omit. pilul. Cont. mist. amar. cum sennâ, ut antea.

29th. — Pulse 92; stools fluid; pale gravel-like sediment. Says he feels generally better; but the tightness across his breast and pain in his head, he says, still continues.

30th. — Pulse 74, and regular; feels better. — Cont. haust. amar. bis die.

31st. — Stools quite natural; pulse 90; feels better. — Cont. med.

September 1st. — Feels still better; no pain of side; stools natural; mouth affected with ptyalism. — Cont. haust. amar. cum sennâ, bis die.

2d. — Stools of a yellow colour, but very fœtid, otherwise nearly the same. — Cont. med.

3d. — Stools natural; pulse 68, and regular; mouth continues very sore, with ptyalism; tongue clean; skin natural. — Mist. purg. ʒij. stat. Cont. haust. amar. cum sennâ. Says he feels light in the head when he sits up.

4th. — Stools very fœtid; medicine purged him freely yesterday; mouth better; ptyalism continues; otherwise nearly the same. — Cont. haust. amar. cum sennâ, ut antea. 5th. — Cont. Repet. pulv. purgans.

6th. — Stools rather scanty, and dark coloured; says he feels an increase of pain in his head; tongue clean; mouth better; pulse 80, and regular. — Repet. pulv. jalap. comp. ʒj. stat. Cont. haust. amar.

7th. — Pulse 80; stools natural. — Cont. med.

8th. — Tongue clean; pulse 64; skin natural; stools quite regular. — Cont. med.

9th. — Pulse 64, and good; skin natural; bowels rather costive; feels the pain and lightness still in his head. Says he is quite giddy when he walks about. — Pulv. jalap. comp. ʒj.

10th. — Stools rather scanty, and tinged with blood, otherwise nearly the same. — Mist. purg. stat. Cont. alia. 11th. — Cont. med.

12th. — Haust. purg. stat. Cont. alia.

13th.—Bowels freely open, and is better.—Cont. med.

14th.—Says he feels weak; otherwise better. Recovery on the 16th.

Remarks.—The disturbance which supervened to the functions of the heart, and the symptoms of congestion in the head, seemed to us to arise from the retention of morbid bile in the primæ viæ. The pain in the chest and side were evidently the sign of congestion of blood in the liver, and led to the employment of leeches. The whole of the symptoms indicated the necessity for a full mercurial action, as well as the free operation of purgatives.

CASE XXXIV.—*Congestion and Accumulation of Morbid Bile, producing Inflammatory Action of the Liver.*

CORPORAL RICHARD DUNN, Madras European Regiment, ætat. 29, admitted 2d February, 1814, at Wallajahbad. Complains of violent pain in the right hypochondriac region, with a sense of fulness about the præcordia; pulse full; skin dry, and rather parched; foul, loaded tongue; bowels generally costive; sometimes purged; stools watery, of a dirty brown colour.—Ol. ricini, ℥ij. stat. Apply twelve leeches to the side, and afterwards a large blister.

Evening.—The oil operated, and he was purged five times; stools of a green colour, with some hardened fæces, and with a dark-brown or blackish scum on the surface; pulse full, soft, and quick, 108 in a minute; skin hot; thirst urgent; tongue cleaner; pain in the side the same. The leeches bled well, and the blister is doing its duty.—Calom. gr. xij. h. s. s. Enema purg. stat. Foment the belly and side. Mist. salin. febrif. ℥j. ; spirit. æther. nitros. ℥ij. M. a wine-glassful every two hours.

3d.—Slept tolerably well; was purged four or five times; stools very offensive, and highly bilious, with some feculent matter; tongue clean; thirst very urgent; pulse 96, full, and soft; the pain is better; he vomited a good deal of green bitter bile in the night; the blister has risen very well.—Cont. mist. salin. febrif. Pulv. purg. et repet. enema.

Evening.—Has been fully purged; stools consist of dark green bile with some mucus; thirst diminished; no pain; pulse frequent and soft; he vomits occasionally, and throws up green bitter matter.—Calom. gr. xij. h. s. Cont. mist. salin.

4th.—Pulse much more regular, 96, full, and soft; no pain; no sickness; less thirst; stools of a brown colour; no straining; tongue clean.—Repet. pulv. purg. et mist. salin.

Evening.—Passed some thick inspissated dark-green bile immediately after taking

the medicine, and has had five motions of the same kind since ; pulse frequent, and rather small ; thirst less urgent. — Calom. gr. xij. h. s.

5th. — Passed much flatus in the night ; stools are dark green inspissated bile ; has no pain ; tongue clean ; pulse 80 ; no appetite ; no thirst. — Dilute freely with congee-water. Repet. pulv. purg.

Evening. — Purged six times, and stools still green, with some fæces of a green colour ; pulse good. — Calom. gr. viij. h. s.

6th. — Had no stool in the night ; pulse good, perfectly natural, and in every respect better. — Pulv. purg. ut antea.

Evening. — Stools watery, of a dark-brown colour ; no pain ; has vomited frequently in the day, and threw up nothing but pure water. — Mist. salin. febrif. ut antea.

7th. — Feels greatly better ; has not had any sickness, nor has he been purged ; pain all gone. — Cont. mist. salin. and a glass of wine.

Evening. — Has had two natural stools. — Cont. ut antea.

8th. — Has no complaint but weakness. — R Tinct. calumb. ʒij. ; tinct. cinchon. ʒss. ; aquæ menth. pip. ʒij. M. ft. haust. stat. sumend. et repet. vespere.

Evening. — Feels quite well. — Cont.

9th. — Had one stool, perfectly natural ; feels quite well. — Haust. purg. ʒxij.

10th. — Perfectly recovered, and returned to duty.

CASE XXXV. — *Congestion of the Liver, with Accumulation of Bile.*

JAMES HILLACK, Madras European Regiment, ætat. 27, admitted the 28th of February, 1814. He is a very hard drinker, and eats all manner of trash ; has been complaining for three or four days of feverish symptoms, which generally come on at night, and continue for half an hour ; they are then followed by cold shiverings, which continue on him for ten or fifteen minutes ; his tongue is foul ; skin hot ; pulse somewhat quick ; and he has oppression and fulness about the chest, as if he had not room to breathe. — Calom. gr. xij. h. s. s.

March 1st. — Says he has been purged seven times ; stools not very copious, of green viscid mucus, with some feculent matter ; bitter taste in his mouth ; no fever. — Ol. ricini, ʒiij. statim.

Evening. — Stools highly bilious, of a dark-green colour, and very viscid and offensive ; feels pain across his belly, particularly about the epigastrium, and a very great fulness ; cannot bear any pressure ; no fever ; has bitter taste in his mouth, and thirst urgent. — Apply fourteen leeches to the scrobiculus cordis. — Cal. gr. xij. h. s. s.

2d. — No fever; stools feculent, of natural consistence, but dark-green colour; pain and fulness diminished; bitter taste in his mouth removed; tongue clean; pulse good. — Ol. ricini, ℥iij. statim.

Evening. — Purged eight or nine times; stools very copious, highly bilious, of a dark-green colour, with a vast quantity of viscid mucus; feels very much better; no pain whatever; tongue clean. — Calom. gr. xij. h. s.

3d. — Purged twice, rather free; stools brown colour, and crude; skin moist; pulse good; tongue clean. — Ol. ricini, ℥iij. statim.

Evening. — Stools highly bilious and green, with some perfectly natural-coloured fæces. — No medicine.

4th. — Felt some pain in his bowels during the night, and had a slight rigor about 12 o'clock, which did not last long upon him; he slept tolerably well afterwards, and had two small, clay-coloured motions, with a great deal of viscid, glairy mucus. — Repet. ol. ricini, ℥iij. statim.

Evening. — Fully purged; motions perfectly natural. — No medicine.

5th. — Quite well. — No medicine.

6th. — No complaint whatever. — Haust. purg. ex aquâ Chelt. ℥xij.

7th. — Discharged, quite recovered.

CASE XXXVI. — *Congestion of the Liver, with Accumulation of Morbid Bile, and a loaded State of the Colon.*

THOMAS WRIGHT, admitted 22d April, 1814. Complains of pain in the right side, increased by breathing or the least pressure; abdomen swelled and tense; has cough and some degree of dyspnœa, but at present the ailment seems to be principally in the abdomen; pulse 86; skin hot; tongue foul; bowels irregular; appetite impaired. — Eighteen leeches immediately, and a blister afterwards. Pulv. purg. et mist. salin.

Evening. — Stools green, viscid, bilious matter; pulse 84. — Calom. gr. xij. Cont. mist. salin.

23d. — No stool; no pain since the blister; pulse 90; tongue yellow; skin moist. — Ol. ricini, ℥ij. Cont. mist. salin.

Evening. — Stools foul, bilious, and copious; tongue still loaded. — Calom. gr. xij.

24th. — Stools yellow and copious; pulse 86; skin moist; some griping. — Ol. ricini, ℥iij. Cont. mist. salin.

Evening. — Stools copious, morbid, and acrid; no pain; pulse 84; skin moist; appetite better. Calom. gr. xij.

25th.—Much better; tongue foul and yellow.—Aquæ Cheltenhamii, ℥xij. Cont. mist. salin.

Evening.—Stools grass-green colour, very viscid, and tenacious.—Calom. gr. xij. Mist. salin.

26th.—Stools clay coloured, but scanty; no pain; pulse good.—Ol. ricini, ℥ij. Cont. salin.

Evening.—Stools copious, foul, and feculent; some griping; tongue cleaner; pulse good.—Calom. gr. xij. statim.

27th.—Stools more natural, but scanty; in all respects much better.—Ol. ricini, ℥ij.

Evening.—Stools unusually copious and foul; appear to be fermented; in all other respects he is well.

28th.—Continued this system, and passed amazing quantities of morbid, foul matter, and was discharged; and so far from being inconvenienced by purging, he felt greatly relieved. He returned to duty, perfectly recovered, the 2d of May.

Remarks.—The three preceding cases are in most respects alike, and in them the vascular congestion of the liver was evidently connected with a copious discharge of morbid bile and disordered intestinal secretions, which most probably had been accumulating for a long time. Leeching and purgatives were chiefly depended upon in their treatment; and although the local depletion might have been carried further, the purgative plan of treatment could not have received a fuller trial. It should always be recollected by the reader, that, upon an average, as we have already had occasion to state, the Indian leeches draw about nine drachms of blood each; so that fifteen or twenty leeches, applied to a long residenter in India, cannot be considered to be altogether inefficient as a local depletion.

CASE XXXVII.—*Active Congestion, with Accumulation of Bile, running into Inflammation.*

THOMAS MARSHALL, private, Madras European Regiment, ætat. 19, in camp at Kurnoul, weather being extremely hot and oppressive, admitted 12th April, 1817. Complains of soreness over his head, and pain when he touches it; also of pain in his right side, under the fifth and sixth ribs, which affects his breathing; tongue foul; bitter taste in his mouth, and he vomits green bile; pulse frequent, 96 in a minute, but regular.—Apply twenty-six leeches to the right hypochondriac region. Mist. emet.

Evening.—Tongue cleaner; vomited a great deal of dark-green bile; soreness in

his head gone, but he is giddy; breathes with more ease, and the bitter taste in his mouth is diminished; pulse the same as morning, but softer. — Calom. gr. xij.; pulv. ant. gr. vj. Ft. pilul. h. s. s. Mist. salin. febrif.

13th. — Stools scanty, but feculent; feels the pain much diminished; tongue cleaner, but still a little furred; has giddiness in his head, but slighter than it was previously; pulse 78, very hard, and every alternate stroke is more strong than the preceding one; no sleep. — Apply twenty leeches to the temples. Mist. purg. ℥ij.; mag. vitriol. ℥iij. M. ft. haust. stat. capiend. Mist. salin. febrif. secundis vel tertiis horis.

Evening. — Pain in his head gone since the leeches; pulse more regular; stools dark-blue colour; thirst; some heat of skin; no cold fit. — Calom. gr. xij. h. s. Mist. salin.

14th. — Much better; stools of a more natural appearance, and feculent; had fever in the night, from the closeness of the atmosphere; tongue cleaner; pulse 84, and soft. — Haust. purg. ut antea. Mist. salin. ut antea.

Evening. — Much better in every respect; stools copious. — Haust. amar. cum sennâ, ℥ij. h. s. s.

15th. — No pain at all; bowels loose; stools watery; no headach; pulse natural. — Haust. amar. cum sennâ, ℥ij. stat. et repet.

16th. — Stools watery, with feculent matter; he feels weak; has no pain at all; appetite good. — Cont. haust. amar. et mist. salin. cum aq. ammon. ℥j.

17th and 18th. — Feels very well. — No medicine. Two glasses of wine.

19th. — Was seized on the march* this morning with pain in his right side. Apply twenty leeches.

Evening. — The pain in his side is not so severe as it was this morning, but it still continues; the leeches bled well; tongue rather excited, but clean; pulse full and strong. — Apply eighteen leeches. Calom. gr. xx. h. s. Cont. mist. salin. ut antea.

20th. — Mist. purgans.

Evening. — Purged very well; feels better. No opportunity of examining the motions. — Calom. gr. xij. 21st. — Pulv. purg.

Evening. — Tongue dry; no pain; a good deal purged. — Pilul. hydr. cum. calom. no. 1, ter in die. Haust. anod. h. s. s.

22d. — Halted; his stools watery and offensive; tongue clean; pulse regular; no fever. Contin. pilul. ut antea. Haust. amar. cum sennâ, ℥j.; aquæ ammon. ℥xxx. M. night and morning.

23d and 24th. — Continue.

* Marched from Kurnoul for Hyderabad this day, 19th April.

25th.—The warmth of the weather and marching are much against him, and retard his recovery.—Cont. pilul. et haust. ut antea.

Evening.—Haust. amar. com. ut suprâ, h. s. s.

26th.—Has no complaint but weakness.—Cont.

Evening.—This medicine acts very well on his bowels.—Haust. amar. ut suprâ, h. s.

27th.—Tongue furred and dry; slight headach, which appears to be occasioned by the extreme heat; his bowels are very well.—Omit the opening medicines and continue mist. salin. cum aq. ammon. et spirit. æther. nitros.

Evening.—Says he is much better; his tongue, however, is white and excited.—Continue.

28th.—Has a good deal of fever, but I believe it arises more from the heat of the weather than any thing else; the pulse is quick and excited.—Cont. ut antea. About 3 o'clock, P.M. he complained of great weight and oppression about the stomach, and some sickness.—Mist. et emet. Haust. amar. ut antea, h. s.

29th.—Threw up a great deal of bile, and is much better this morning.—Pulv. purgans.

Evening.—He feels much better, but his tongue is still white and excited,—more, I think, from the weather than disease.—Cont. mist. salin. cum vin. antim. $\bar{3}$ ss.

30th.—Says he feels much better, but the tongue is still excited; pulse quick and rather hard; has no pain of any kind, but the weather is uncommonly oppressive, even to persons in health.—Cont. mist. salin. Keep the bowels regular, and attend to his diet.

This man had, a few days afterwards, a return of the inflammatory symptoms, with pain in the region of the liver, which were removed by the application of twenty-four leeches, followed by a blister and active purgation. He continued convalescent for several days, when inflammatory action again supervened in the liver, and was again removed by the same remedies. He afterwards recovered under the use of aperients, alteratives, and gentle tonics, and was discharged about the end of May.

Remarks.—This patient was admitted while encamped at Kurnoul, when the weather was extremely hot and oppressive, the thermometer ranging, in the shade, from 84 to 110. The extremely high temperature, together with the exposure inseparable from a long march, aggravated the disorder, and rendered it more difficult of cure. This case more properly belonged to the head of inflammations than to that of congestion of the liver, particularly with regard to the relapses experienced on the march to Hyderabad. But as it exemplifies well the supervention of inflammation to congestion and accumulation of bile on the liver, we have inserted it at this place.

SECTION V.

Of Torpor of the Functions of the Biliary Organs.

It has been remarked by Dr. Good, that feeble children who secrete little bile may have the biliary ducts clogged up with mucus; and from an atony of the absorbents of the viscus, the liver may thus become enlarged. We believe that such is also frequently the case, in warm climates, in adults as well as in children. But the atony of the viscus seems to us to be general, as respects the functions of the different vessels and nerves with which the organ is supplied. When the vital energy of the hepatic apparatus is exhausted, in consequence of dissipation, drunkenness, and other causes which will soon be considered, the bile which is formed is either diminished in quantity or of a depraved quality, and sometimes it is both. In scrofulous habits the extreme ramifications of the hepatic ducts are liable to accumulations of mucus in their channels, which obstruct the flow through them of whatever bile is secreted; and thus the granular structure of the organ becomes infarcted with bile and mucus, until the organ acquires, in some cases, a scirrhus enlargement, and in others, until partial attacks of chronic inflammation supervene to the state of obstruction, and give rise either to the deposition of new matter, in the form of coagulable lymph, or to the formation of small and numerous abscesses in the substance of the viscus. The obstructions thus placed in the way of the due secretion and circulation of the bile through the biliary ducts, in process of time occasion partial congestion of blood in the ramifications of the portal vein; for the venous blood circulating in this important vessel being undiminished and insufficiently changed by the secreting process, is more likely to become retarded in the course of its return through the small vessels forming the terminations of the portal vein and the radicles of the hepatic vein; and thus congestion, necessarily, will slowly supervene to the state of torpid function, and will affect the substance of the organ partially in some cases, and more generally

in others, according to the extent of disordered function in which it originates. In many cases of congestion, as we have already seen, this state of the vessels supervenes without any appearance of the previous existence of deficient or torpid function of the organ. It seems to proceed, in such cases, from causes which, either directly or indirectly, determine an accumulation of blood in the vessels, at a time when the secreting actions are not very manifestly or seriously disturbed previously to the supervention of the congested state. An atonic or weakened state of the congested vessels, or some other state of predisposition, no doubt, obtains about the time that this particular disorder supervenes; but such states amount not to disease, nor occasion any very marked derangement of the secretion, previously to the supervention of congestion. When, however, torpid function is present, and more particularly when it has been of any considerable duration, venous congestion of the vessels of the liver should always be dreaded, and its existence, as far as it may be ascertained, should be carefully inquired into. Congestion, thus supervening to torpor of the secreting energy of the organ, and retarded circulation in its vessels, tends to perpetuate both these conditions, and to increase the disease; until enlargement of the organ, chronic inflammatory action of the vessels in its substance, or even acute attacks of inflammation, supervene, according to the temperament and habit of the individual, and the causes of disorder to which he is subjected, giving rise to organic changes of the most formidable nature.

Torpor of the liver, then, may arise simply from a diminished or exhausted energy of the secreting functions of the organ; and, from this state, complicated with accumulations of bile in the biliary ducts and gall-bladder, and with congestion in the blood-vessels of the organ; the former state of disorder gradually superinducing, and becoming complicated with, the latter derangements.

Torpor of the liver is generally complicated with dyspepsia, and not infrequently originates in that disorder, particularly in protracted cases. Habitual over-excitement of the stomach and liver, from eating much animal food and highly-spiced dishes, and from the inordinate use of spirituous and vinous liquors, not infrequently induces a torpid condition of the secreting functions of the liver, particularly when the habitual causes of the over-excitement

are withdrawn suddenly, and entirely cease to act. The weakened state of the duodenum and small and large intestines, or inactivity of these viscera, not infrequently extends itself to, or is complicated with, torpidity of the functions of the liver. For in cases where, from the weakened actions of the duodenum and inferior portions of the alimentary canal, their internal surface soon becomes covered by a coating of thick and tenacious mucus, so that the ingesta and secretions poured into them cannot come in contact with their mucous coat in such a manner as to excite them to healthy and active operation; and hence the emulgent effect usually produced upon the mouths of the ducts from continuity of surface and consent of action, is very inefficiently performed, if at all; and thus a similar state of function to that existing in the alimentary canal is extended to the liver. Habitual inattention to the due and daily discharge of the bowels is also one of the chief causes of disorder operating upon the biliary secretions, through the medium of the digestive organs.

Over-excitement, also, of the perspiratory functions, from long-continued marches, fatiguing exercises, and too warm clothing, is not infrequently productive of considerable exhaustion of the secreting actions of the liver, and often disposes it to torpor, venous congestion, and accumulations of bile in the biliary ducts, upon the slightest exposure to cold, to moisture, to the impression of malaria, and when the depressing passions are brought into operation, or when hurtful or indigestible matters are taken into the stomach.

In addition to these causes, the habitual use of too much animal food should be enumerated, inasmuch as this species of diet furnishes very abundant materials for the liver to operate upon, and thus exhausts the energy of its functions. It also tends more than any other cause to the production of a too abundant secretion of bile, to accumulations of bile in the gall-bladder and ducts, and to venous congestions of the liver; and it indirectly produces torpor of the vessels from congestion and engorgement. Of all the causes, however, which often combine to produce torpidity of the liver, there are none of more general or more potent operation than the neglect of exercise. Indolence and full living is productive of torpid function

of the liver in all climates; and in warm climates, especially in India, not only does this particular state of the organ supervene as a necessary effect of this cause, but it is also accompanied with congestion of blood in the veins of the organ, and with accumulations of bile in the biliary conduits and receptacle. Next in importance to this cause is a neglected state of the bowels. Such neglect is very frequently observed in soldiers, and, indeed, in all ranks of life, and is hurtful, as we have already had occasion to shew, by allowing viscid and tenacious mucus to form upon the internal surface of the alimentary canal, impeding its functions, sheathing the mucous coat from the requisite influence of the ingesta passing along it and of the secretions poured into it from the liver and pancreas, and even obstructing the mouths of the ducts of these viscera, and shielding them from the healthy and natural stimulus which the chyme affords to the ducts, and, through them, to the viscera themselves. An open state of the bowels, and an occasional or appropriate aperient, seem to act beneficially upon the functions of the liver in a threefold capacity;—viz. they preserve a free discharge of bile from the gall-bladder into the duodenum,—they promote a due circulation of this fluid along the biliary ducts,—and they keep up a free circulation of blood in the portal vessels.

Having thus stated what appears to us to be the chief causes of torpid function of the liver, as well as the pathological states to which these causes lead,—namely, a diminished and, perhaps, a vitiated secretion of bile, together with a retarded flow and discharge of that which is secreted, giving rise to its viscidty, to obstruction of the biliary ducts, and to congestion of the portal vessels, we now proceed to notice some of the more prominent symptoms by which this species of functional disorder may be recognised.

Torpor of the functions of the liver is a condition which cannot always be detected with precision, even after the most careful examination. If, however, we find the patient to complain of want of appetite,* drowsiness, with

* It should be remarked, that the appetite is not always diminished; it is often unimpaired, or even greater than natural. When this is the case, the body is not nourished to the extent

pain over the eyebrows, lowness of spirits and hypochondriacal feelings,* dark and high-coloured urine, a costive state of the bowels, and pale or clayey motions, a dark or sallow countenance, wasting of the flesh, slow and painful digestion, with the symptoms noticed in a previous section as constituting diminished function of the stomach, flatulency, particularly of the bowels, without any evident fulness or enlargement in the region of the liver, but with a bitter or disagreeable taste of the mouth, and a loaded state of the tongue, particularly in the morning,—we may reasonably infer that the functions of the liver are inadequately performed; but it is by no means so easily to be determined whether or no such torpor is the result merely of diminished function, or of change of the structure of the organ, unless we are acquainted with the patient's habits and the nature of his former ailments. When the foregoing symptoms occur in one addicted to the use of spirituous liquors, or in one who has resided long in a warm climate, and suffered former attacks of hepatic disease, then the latter alternative may be more reasonably inferred.

When the foregoing symptoms are conjoined with those we have already noticed as marking the existence of accumulations of bile and congestions of the blood-vessels of the organ, it may be inferred that torpor is associated with these particular derangements.

Before we leave this part of our subject it may be remarked, that torpor of the liver not infrequently supervenes to attacks of acute inflammation of the organ, and is very often associated with, and consequent upon, repeated attacks of ague, even when no organic change of the viscus is present. These facts, as well as the co-existence, or rather the dependence, of torpor upon enlargement of the liver, and upon tubercular formations and schirrosities in its substance, will be noticed hereafter.

We conclude the remarks which belong to this part of the subject with

that may be expected from the quantity of food taken. Sometimes the stools are like chalk and water, or lime and water, mixed up, with a yellowish scum on its surface; at other times they have the consistence and appearance of putty.

* Occasionally, the spirits are good; but much more frequently the reverse.

the details of some cases illustrative of the simple form of torpid function of the liver, and its connexion with congestion of the blood-vessels of the organ and with accumulations of bile in the biliary ducts and gall-bladder.

CASE XXXVIII.—*Torpor of the Liver, and Accumulation of Morbid Secretions in the Alimentary Canal.*

JOHN M'KAY, private H. M. 78th Regiment, admitted 30th April, 1811. It appears that he has been complaining for some time, that he had the fever at Walcheren, and that he has never been quite well since,—a period of three or four years. He complains of constant pain at his stomach and in his bowels; is troubled much with flatulence, and his bowels are extremely irregular; sometimes purged, but generally bound, and his motions are hard; they come away quite dry, and in round balls; tongue white, but moist, with a dark appearance spread over it, as if he had been sucking ink from a pen.—Cal. gr. vj.; opii puri, gr. j. Ft. pil. h. s. s. Ol. ricini, ℥ij.; m. s.

May 1st.—Vomited the oil about two hours after he took it, and was not purged.—Enema purgans mane nocteque.—Had one stool after the last enema.

2d.—Complains of sickness at stomach, and bitter taste in his mouth; has not had any motion since last night.—Give vi. gr. pulv. ipecac. every ten or fifteen minutes till it operates. This removed a quantity of pure green bile from his stomach. Haust. anodyn. h. s. s.

3d.—Feels weak, but has not been purged.—R Magnes. vitriol. ℥j. stat.; rep. enema purgans vespere.

4th.—Has been fully purged and is much better, but feels low,—I imagine from the effects of the purgative.—R Conf. aromat. ℥ij.; ammon. carbon. gr. x.; aq. ammon. ℥℥x.; aq. menth. pip. ℥ss. Take three table-spoonsful every three hours. Cont. enema ut antea. Sago and wine for diet.

5th.—Was much troubled with flatulence in the night; there is a considerable degree of tension and hardness about the præcordia; feels a good deal of debility, but his pulse is good; considerable hardness throughout the colon.—Apply a blister to the scrob. cordis. Cont. mist.; pil. hyd. no. 1, nocte maneque. 6th.—No change.

7th.—Was purged, and feels better.—Contin. cal. gr. vj.; opii, gr. j. h. s. s.

8th.—Purged frequently by the calomel; stools more natural, but pale coloured; pulse 66, soft and full; countenance very ghastly, but we certainly think him better on the whole.—Cont. pil. et mist. ut antea. 9th.—The same.

10th.—Had frequent stools in the night, frothy and yellow; feels better.—Rep. calomel. gr. vj. et opium.

11th.—Had a return of pain yesterday evening, but was relieved by the pill; the enema this morning brought away a great quantity of hardened fæces; he always feels better after copious purging.—Cont. pil. hydr.; cont. enema; et rep. calomel.

12th.—No change.

13th.—Passed a good night; bowels more regular.—Cont. med.; omit the calomel.

14th.—Had three good stools since last night; the hardness throughout the course of the colon remains; he feels relief after every evacuation.—Cont. med. ut antea. 15th, 16th, 17th.—No alteration.—Cont.

18th.—Not so well this morning; passed a restless night.—Rep. calomel. gr. vj. ut antea.

19th.—Has been purged, but he complains that the pain in his stomach continues.—Pil. hydr. et enema as before. Omit calomel. 20th.—No alteration.—Cont.

21st.—Has a bitter taste in his mouth, and giddiness in his head.—Mist. emetic. statim. Cont. ut antea.

22d.*—The emetic brought up a great quantity of white, frothy, and viscid mucus, which floated in water; he was much relieved, and slept well.—Cont. pil. hydr. ut antea; opii. gr. j. h. s. s. 23d.—The same.

24th.—Tongue more natural and cleaner.—Cont. 25th.—The same.

26th.—Had a return of pain last night; no stool.—Mist. purgan. ℥ij. stat. Cont. pil. hydr. ut antea.

27th.—Fully purged and much better.—Cont.

28th.—Complains of heaviness and sickness at stomach; bowels regular.—Rep. emetic, et cont. enema.

29th.—He feels much better; the vomit had very little effect; he passed, however, several black slimy stools this morning.—Calomel. gr. viij. h. s. s.; mist. purgan. ℥ij. Cras. m. s.

30th.—Passed a good night; the purging mixture was rejected this morning.—Rep. mist. purgan. et cont. enema.

31st.—Has been purged very largely, and is wonderfully better this morning.—No med. Cont. enema, ut antea.

June 1st.—Bowels more regular; had a natural evacuation this morning, but complains of a bitter taste in his mouth, and an offensive smell.—Cont. enema.

* Large doses of calomel might have been useful here, but at this time we did not know the advantages which attach to them.

Eight o'Clock, P.M. — Pulv. emetic. stat.

2d. — Vomited a quantity of thick viscid mucus; feels much relieved; tongue gaining its natural and healthy appearance; had a good motion this morning. — Pil. hydrarg. nocte maneque. Cont. enema, ut antea.

3d. — The hardness in the course of the colon wonderfully removed. — Cont. ut antea. 4th and 5th. — Cont.

6th. — No return of pain. — Cal. gr. x. h. s.; ol. ricin. $\bar{3}$ ij. Cras. m. s.

7th. — Fully purged; much better. — Cont. pil. et enema. 8th and 9th. — Cont.

10th. — No change. — Rep. cal. gr. x. h. s. et mist. purgan. Cras. m. s.

11th. — Has been very fully purged, and passed a great quantity of slime and thick viscid mucus. — These medicines were continued every alternate day till the 19th, with the daily use of enemata, when he was perfectly recovered, and discharged fit for duty. He found more immediate relief from emetics than from any thing else, and the quantity of viscid mucus thrown off his stomach was incredible. He began to recover from the 21st April, and became a stout healthy man, when the regiment landed at Java, where he was killed storming the entrenched works at Cornelis.

Remarks. — Torpid function of the liver may have been connected in this case with some organic change in its substance: it was, however, obviously accompanied with accumulations of morbid secretions upon the mucous surfaces of the digestive canal. Had this case occurred more recently in our practice, we should have preferred the exhibition of larger doses of calomel at bed-time, followed by a brisk cathartic draught in the morning, to the milder means which were employed.

CASE XXXIX. — *Torpor of the Liver, with Congestion and Accumulation of Bile.*

JOSEPH JOHNSTON, corporal, Madras European Regiment, ætat. 26; a healthy man. 16th January, 1813. Has had feverish symptoms, he says, for three or four days, but did not complain till late this evening. He has sickness at stomach, bad taste in his mouth, and foul loaded tongue. — Mist. emetic.

17th. — This vomit operated very well, and brought up a considerable quantity of green bitter bilious matter; he was also purged three or four times, and feels generally better; but he complains of cold shiverings and flushing of heat occasionally; pulse quick; tongue foul. — Calomel. gr. x. stat. *Twelve o'Clock.* — Pulv. purgan.

Vespere. — Has been fully purged, and he feels better. — Calomel. gr. iij. h. s. s.

18th. — Says he is much better this morning; tongue clean, but dry: pulse good; had a slight shivering at twelve o'clock last night. — *Haust. purgan.* ℥ij.

Vespere. — Purged four times; felt a cold shivering this morning about twelve o'clock; he has a bitter taste in his mouth; and his motions are green. — *Calomel.* gr. x. h. s. s.

19th. — Had the shivering in the night as usual; pulse good, about 82 in a minute; skin moist; motions not morbid, rather deficient of bile; tongue foul. — *Pulv. purgan.*

20th. — Complains much of bitter taste in his mouth, and nausea. — *Mist. emetic.*

Vespere. — Vomited five times, and threw up a quantity of green bitter bile; tongue rather dry and blanched; he has no headach; bowels very torpid. — *Calomel.* gr. x. h. s. s. *Haust. purgan. ex aq. Chelt.* ℥xij. at three o'clock, A.M.

21st. — Has been purged by the waters; his tongue is foul and loaded; had no fever during the night; but he feels a considerable pain in the right side; skin rather dry. — *R Mist. salin. febrif. ℔j.; antim. tart. gr. j.; spt. æther. nitros. ℥ss. M. ft. mist.;* a wine-glassful every two hours.

Vespere. — Had slight fever during the day; tongue moist and cleaner; stools brown and watery; pain in the side continues. — Apply a blister to the side. *Calomel.* gr. viij. h. s. s. *Cont. mist. salin. feb. ut antea.*

22d. — Pain in his side much easier; had one motion in the night; had a slight attack of fever about three o'clock this morning. — *Olei ricin. ℥iij. stat. Cont. mist. salin. ut antea.*

Vespere. — Purged five times; stools green and more feculent. — *Calomel.* gr. viij. *Cont. mist. salin.*

23d. — Complains this morning of bad taste in his mouth, and his tongue is foul; motions more natural in appearance. — *Repet. mist. emetic.*

Vespere. — Was fully vomited, and threw up a quantity of dark green water; has not been purged, but he feels better. — *Pil. hyd. gr. ij.; pil. aloës cum myrrh. gr. ij.; syr. q. s. ft. pil. h. s. s.*

24th. — Says he is certainly better this morning, and felt less feverish heat, but his tongue is very foul; had no motion in the night. — *Repet. pilul. ut antea. Haust. purgan. ex aq. Chelt.* ℥xij.

25th. — Was purged three or four times yesterday, but he complains again of bitter taste in his mouth, and his tongue is very foul. — *Repet. mist. salin. cum antim. tart. gr. ij.*

Vespere. — Vomited some bile. — Cont.

26th. — His tongue is cleaner. — Repet. mist. cum ant. tart. gr. iij.

27th. — Had a perfectly natural motion in the night; the tongue is cleaner; and he feels better, and less bitter taste in his mouth. — Pulv. purgan. stat. and repeat in one hour if the first does not operate. Cont. mist.

Vespere. — Has been purged eight times; stools copious and highly bilious. — Calomel. gr. viij. h. s. s. Cont. mist. salin.

28th. — Had no fever last night, and feels better this morning; was purged three or four times in the night; tongue still foul, but cleaner than it was. — Pulv. purgan. stat. Cont. mist.

29th. — Feels better; tongue the same; no fever; motions clay coloured and lumpy. — Pil. hydrarg. gr. v. nocte maneque. Haust. purgan. aquos. ℥xij. stat.

30th. — Has passed a great deal of morbid, putty-like, clay-coloured matter; feels considerably better; tongue clean; no fever. Cont. pil. et haust. purgan.; discontin. mist. salin.

31st. — He is comparatively well; pain quite removed; tongue clean. — Cont. pil. ut antea, et haust. purgan. ℥xij. every morning.

This was continued without intermission till the 5th February, when he was perfectly recovered and discharged.

Remarks. — In this case the energy of the liver seemed insufficient to enable it to circulate the bile which had been secreted. The continued operation of purgatives, with emetics, when the state of the stomach appeared to require them, and blisters, proved serviceable, and superseded the necessity of other means.

CASE XL. — *Much Torpor of the Liver, with Congestion.*

JOHN JOHNSTON, private, Madras European Regiment, admitted the 20th February, 1813, having just come off a march from Quilone. He was attacked on the march with feverish symptoms, to use his own words; he has not had a passage in his bowels for *nine days*; his tongue is foul, but he has no fever. — Ol. ricini, ℥iij. stat.

Evening. — Purged three or four times; stools watery, of a pale bright yellow colour; has passed some hardened fæces; pulse quick; skin cool. — Calom. gr. viij. h. s. s.

21st. — Took ℥iij. ol. ricini very early this morning; has not been purged by it; very thirsty; tongue foul and dry, as if he had been drinking very hard, which we believe has been the case; his motions are watery, small in quantity, and of a pale yellow colour; has a heavy pain across the stomach, with some fulness and pain on pressure;

pulse small and quick.—Apply eighteen leeches to the pit of his stomach. R Mist. salin. febrif. ℥j.; spirit. æther. nitros. ℥ss.; aquæ ammon. 3j. M.; a wine-glassful every hour.

Evening.—The leeches have bled well, and he is easier; tongue foul and loaded; stools green and curdled; leeches are still bleeding.—Calom. gr. x. h. s.

22d.—Two moderate motions in the night, and one this morning, approaching to a natural colour; the wounds made by the leeches continued to bleed for a great part of the night, and he says he feels languid and weak in consequence; pulse regular; belly easy; tongue much furred: thirst urgent; no return of appetite.—Haust. purg. (aquæ Cheltenham.) ℥xij. stat. Cont. mist. salin. febrif. ut antea.

Evening.—One alvine evacuation since last report, quite natural; his thirst is less urgent, and he feels altogether better.—Pilul. hydr. gr. v. h. s. s.

23d.—Free from pain, and feels stronger this morning; no motion; thirst less; pulse regular.—Haust. purg. (aquæ Cheltenham.) ℥xij. stat.

Evening.—Two light-coloured stools since morning; has no complaint but weakness.—Repet. pilul. hydrarg.

24th.—Continues to improve; no motion.—Mist. salin. ut antea.

25th.—No complaint but weakness.—R Infus. gentian. ℥jss.; tinct. sennæ, ℥ss. M. This was continued twice a day till the 29th, when he was discharged.

Remarks.—This man was considerably exhausted by increased perspiration and fatigue during a long march, occasioning torpor and debility of the digestive and biliary functions. On his arrival, the excesses in which he had indulged, evidently occasioned active congestion of the liver, evinced by the weight and dull pain felt at the epigastrium; and the previous state of debility of the organ, with torpor of its functions, predisposed it to this condition; to remove which, the leeches were ordered. The motions which were procured during his continuance in hospital presented evident signs of deficient function of the liver; and this torpor continued even after the congestion occasioned by his excesses was removed.

CASE XLI.—*Torpid Function of the Liver, &c.*

JAMES KENNEY, recruit, ætat. 17, a recent arrival, admitted 12th July, 1816, at Trichinopoly. Complains of pain in his head, great weakness, and a burning heat all over his body, with oppression and uneasiness about the epigastric region; tongue clean and moist; skin warm; has felt unwell since morning: it is now 5 o'clock, P.M.—Mist. emet. stat. Haust. anodyn. h. s. Apply twelve leeches to the head.

13th. — Complains very much of pain in his head, but it is better, he says, since the leeches were applied; the vomit operated, but did not bring away any bile; his tongue is dry and furred; skin cool, rather below the natural temperature; pulse 66 in a minute; he has not had any stool; feels a fulness at the præcordia, and a dull sense of pain. — Apply twelve leeches and a blister. Mist. purg. \mathfrak{z} ij. stat.

Evening. — Much relieved in every respect; has been well purged; stools are of a clay consistence and colour, hard and lumpy. — Calom. gr. xij. h. s. s.

14th. — Passed a good night, and is much better. — Mist. purg. \mathfrak{z} ij. stat.

Evening. — Has not been purged; feels heated; pulse frequent; skin moist and warm. — Mist. salin. febrif. every two hours. Calom. gr. xij. h. s. s.

15th. — Has had two green viscid motions during the night, and feels better. — Mist. purg. \mathfrak{z} ij. Cont. mist. salin.

Evening. — Fully purged; motions variegated, of all colours, green, natural, and light brown; feels quite well. — Calom. gr. xij. Repet. mist.

16th. — Is quite well. — Mist. amar. cum sennâ, \mathfrak{z} ij. night and morning. This was regularly continued till the 19th, when he was discharged for duty.

Remarks. — This seems to have been a case merely of deficient function of the liver, with slight accumulation of bile upon the biliary organs, occasioning headach and the other symptoms complained of. The advantages derivable from the free and continued use of purgatives in such cases are very evident.

CASE XLII. — *Torpor and Congestion of the Liver, followed by copious Discharges of Bile.*

WILLIAM VARLEY, ætat. 33, Artillery, 14th March, 1820, 8½ A.M.: admitted this moment, with severe pain at the epigastric region; respiration hurried; pulse feeble; skin below the natural heat, in a slight degree; attacked with vomiting of a watery fluid at seven o'clock this morning. Bowels have been generally costive, notwithstanding the employment of purgatives on various occasions: they are now constipated. He complains of anxiety, but his countenance is pretty natural; he feels no pain in his head, although his eyes are suffused, and his forehead feels very hot; but has considerable thirst. Says he was quite well, excepting the confined state of his bowels until this morning, but he felt a slight pain at the epigastrium yesterday morning. — R Hydr. submur. \mathfrak{z} j. quàm primùm; cum haust. infrà præs. R Spirit. ammon. comp. \mathfrak{z} ss.; mist. camph. \mathfrak{z} jss. M. ft. haust. App. hirud. xx. reg. epigast. et vj. utrique tempori. Habeat enema purg. stat. Covered with cumblies.

Ten o'Clock, A.M. — No return of vomiting since admission, and he says he feels quite easy; leeches performed their duty well; no stool from the injection; pulse firm, 80 in a minute; skin natural. — Repet. enema purg. stat.

Vespere. — Six motions, with scybala and a quantity of feculent matter; no return of vomiting; pulse and skin natural; tongue clean: he feels quite easy; no thirst. — Repet. hydr. submur. ʒj. h. s.

15th. — Had four copious stools in the night, similar to spinach; passed rather a restless night; complains of no pain; pulse 70 in the minute, and regular; skin and tongue natural; some thirst. — Sumat mist. purg. ʒiij. stat.; et repet. post horas tres, si non benè respondeat alvus. Spoon diet.

Vespere. — Purged freely by the first dose; stools of a green colour; free from pain; tongue clean; pulse and skin natural; no thirst. — R Pilul. aloët. cum calom. no. 1. ter die; et capiat mist. amar. cum sennâ, ʒiij. bis die.

16th. — Says he is quite well; one stool in the night, of a black and tenacious appearance; tongue furred, but moist; pulse and skin natural. — Sumat mist. purg. ʒij. statim. Cont. alia.

17th. — Two stools, of a natural appearance; no complaint. — Omit. pilul. Cont. haust. omni mane.

18th. — Convalescent. — Cont. haust. 20th. Discharged.

Remarks. — The habitually confined state of bowels of which this patient complained before his attack, was characteristic of diminished function of the liver. The continuance of this gave rise to congestion, probably in the way which we have contended for at page 369; and the constitutional disturbance proceeding from this latter state, when it reached a certain pitch, occasioned the phenomena constituting the disorder. The treatment was directed with the double object of removing the accumulation of bile resulting from the imperfect power of the liver to discharge it, and the congestion of the portal and hepatic veins, in such a manner as was most likely to avoid inducing inflammatory action, either in the liver itself, or in the bowels. The leeches were employed with a view of removing a part of the load oppressing the vascular system, and thus of allowing greater freedom of action. The employment and continued operation of purgatives were here obviously necessary.

CASE XLIII. — *Torpor of the Liver, probably from Organic Changes.*

PATRICK HUGHES, recruit, Madras European Regiment, February 1st, 1817: admitted when in camp. Has been under medical treatment since December, for disorder of the digestive organs, apparently combined with tabes mesenterica; and his stools, till

very lately, have been lienteric and unmarked with bile. He has taken the pilul. aloët. with calom. and pulv. antim., and the mist. amar. cum sennâ: mercurial friction has been used over the abdomen. He is now better; his appetite is good; stools more marked with bile; tongue clean.—Cont. pilul. aloët. cum calom., et pulv. antim. ut antea. Repet. haust. amar. cum sennâ. Cont. frictio.

Evening.—Stools crude, but well marked with bile; feels better.—Cont.

2d.—Stools the same as yesterday, crude; the pain at the scrobiculus cordis is better.—Cont. ut antea.

3d.—Feels great heat in the day, but cannot perspire at all; the pain at stomach is better.—Cont. ut antea. Pulv. Doveri, ʒj. h. s. s.

4th.—Stools completely lienteric; has no pain in his stomach; did not perspire much; skin rather warm this morning; tongue clean.—Cont. pilul. et haust.

Evening.—Stools yellow; and has slight perspiration.—Repet. pulv. Doveri.

5th.—Stools pale and lienteric; has not so much heat of skin; did not perspire at all in the night.—Omit the pills, and take pilul. hydr. cum ipecac. calom. et pulv. antim. three times a day.—Cont. haust. amar. cum sennâ.

Evening.—Stools the same as morning, very offensive; he does not suffer so much from heat as he did, and his skin is rather moist.—Contin.

6th.—No material change; he is beginning to perspire better than he did, but it is partial.—Cont. pilul. et haust.

7th.—Complains of thirst; stools offensive, no fæces, and lienteric.—Cont. pilul. et haust.

Evening.—Stools lienteric and white, with yellow streaks of bile.—Cont. ut antea.

8th.—Thirst continues; skin moist; pulse small; tongue clean.—Cont. pilul., et haust. cum tinct. ferri muriat. ʒxxx.

9th.—Stools the same, white, and very offensive; pulse full and strong.

10th.—Has been rubbing in mercury now for nearly a month, without any effect upon his mouth, and very little change in the appearance of his motions; he feels no pain, or any kind of uneasiness; his appetite is not good, but he eats with a desire; he is extremely weak, and much emaciated.—Omit the pill and friction; and take decoct. cinchon. ℥bj.; acid. vitriol. dilut. ʒxxx. M. A wine-glassful every two or three hours. Repet. haust. amar. cum sennâ, et tinct. ferri muriat. ut antea.

11th.—Stools watery and milky; feels thirsty; skin moister; says the bark heats him, but there is no visible appearance of it.—Omit. haust. amar. et tinct. ferri mur. and continue bark.

12th.—Stools offensive and watery; no other change.—Cont.

13th.—Stools are certainly more marked with bile than usual; tongue clean and moist, but it is smooth, and there are spots on different parts where the papillæ are removed, and a sure symptom of mesenteric obstruction and chronic disease of the mucous coat of the alimentary canal. — Cont. cinchona.

14th.—Stools as usual, but more marked with bile. — Cont. 15th.—Cont.

16th.—Stools the same; the bark heats him. — Omit it; and give acid. nitros. ʒij.; aquæ puræ, ℥ij. M. A glassful three times a day. Cont. pilul. ut antea.

17th and 18th.—Cont.

19th.—Stools more consistent, but still offensive, and of a pale colour. — Cont. acid. Cont. pilul.

20th.—Stools more consistent, and look more healthy. — Cont. omnia. Give two glasses of wine.

25th.—Stools improving, and appearing much more natural. — Cont. This treatment was continued for a fortnight longer, during which time his stools greatly improved, and he returned to duty perfectly recovered.

Remarks.—The torpid function of the liver in this case may have arisen from organic change; but this could not obviously have been to a great extent. The existence of obstruction of the mesenteric glands seemed to us more obvious; but the mucous surface of the alimentary canal was certainly most seriously disordered. The nitric acid was here most serviceable.

Were it necessary, we might detail a variety of cases, wherein diminished action of the liver was connected with dyspepsia and a costive state of the bowels. In these cases there are usually present considerable flatulency, a loaded state of the cæcum and colon, uneasy sensations generally, and a feeling of ill health on the part of the patient, without being so ill as to resort to medical advice. This state often continues for a considerable time without much increase of disorder, until some energetic cause supervenes, such as exposure to cold and wet, sleeping on the ground or in a current of air, intoxication, or the indulgence in intoxicating liquors, &c. and occasions an attack of hepatitis or of dysentery. When the bile is thus secreted in a diminished quantity, and the appetite for food is but little impaired,—states which frequently concur,—the chyme is but imperfectly acted upon, owing to the deficiency in the biliary secretion; and thus chyle is either formed in undue quantity, or of impaired quality. The result of this is diminished nutrition

of the body generally, attended with a foul and disordered state of the alvine secretions and excretions. When the bile is lessened in quantity, the internal surface of the digestive tube is imperfectly excited, and the mucus poured out by the follicular glands is much diminished, and rendered more viscid and consistent; so that it adheres to, and soon accumulates on, the surface secreting it. This accumulation of mucus and tenacious matter on the internal surface of the alimentary canal is still further promoted by the diminished discharge of stimulating bile from the gall-bladder; for when this fluid flows regularly and sufficiently into the intestines, it either prevents the accumulation of viscid mucus upon their internal surface, or liquefies and detaches whatever may have been thus collected. From the experiments and observations we have made on this subject,* we are induced to infer that the bile, which has become more stimulating from its remora in the gall-bladder, previous to its discharge into the duodenum, possesses both the faculty of exciting the mucous surface to increased secretion, and of diluting and rendering more fluid the viscid and tenacious matters lining it during torpid states of the alvine functions. Hence it is that torpor, or impaired action of the function of the liver, is generally attended with a costive state of the bowels, and with accumulations of viscid mucus, imperfectly changed chyme, and other similar matters, upon the internal surface of the bowels, cæcum, and cells of the colon,—accumulations which, if allowed to remain for any considerable time, induce disorder of the mucous surfaces to which they adhere, sometimes of a most serious kind, both as respects its intrinsic nature, and more remote consequences. What these are, we shall have to shew when we come to treat of dysentery and fever.

* See Sketches of the Diseases of India, p. 398 *et seq.*

SECTION VI.

Of the Treatment of the foregoing Functional Derangements of the Liver.

THE treatment which is required in the foregoing functional derangements of the liver, is, in many respects, so similar, more particularly as regards the second and the third forms of disorder, that we shall embrace the consideration of the means of cure appropriate to each under one section, in order to avoid that repetition which a subdivision of the subject would involve. We have already stated, that increased secretion and accumulations of bile generally result from full living upon animal food, and an over-excited state of the circulation of the abdominal vessels and of those of the liver itself, or, in other words, from a determination of blood to these organs, and consequently increased flow of it in the portal veins; and we have further expressed our belief, that when this fluid is thus increased in quantity, it is usually also vitiated in quality. In all cases where we find, upon investigating carefully into the symptoms and the habits of the patient, and the state of the viscera themselves, as far as a manual examination may satisfy us, that the usual signs of increased secretion or accumulations of bile, or congestion of the blood, depend upon too full living, or upon increased determination of blood to the abdominal viscera, — general blood-letting should be resorted to, especially in the plethoric, and in those of a sanguine and irritable temperament, and still more particularly if they have recently arrived in a warm climate. Local depletions, by means of leeches, will be found of advantage in the less robust and older residents, and in those cases where general blood-letting may not be advisable, or after it has been once performed. In such cases, the object is not so much to subdue the disorder actually existing, as to prevent the supervention of inflammation in the liver itself, or in those parts of the alimentary canal with which the morbid secretion comes in contact. The other parts of the treatment, with few exceptions, to be noticed immediately, should also be strictly antiphlogistic. Aperients, cathartics,

or purgatives, are also requisite, according to the state of the bowels, in order to carry off the morbid secretions, and to prevent the supervention of more serious disorder, from their retention upon sensible parts, and those but too prone to take on inflammatory action. When, in consequence of the sudden irruption of acrid bile into the duodenum, after having been for some time retained in the biliary organs, much commotion is produced in the system, with frequent purging and vomiting,—the use of copious draughts of hot diluents, particularly hot water, is essentially beneficial. Warm or hot fluids dilute the bile, and diminish its acrid properties, while they promote its expulsion from the alimentary canal. When, therefore, vomiting supervenes, it may be encouraged by these means; and if retching, nausea, and a bitter taste of the mouth, be complained of, and no symptom of active inflammation of the liver be present, an ipecacuanha emetic will be of advantage, particularly if its effects be fully promoted by the liberal use of warm fluids. After vomiting has been duly performed, the bile, and other secretions which are poured into the bowels, should be removed by the operation of a full dose of calomel; and where there is much symptomatic fever, occasioned by the flow of morbid bile, by calomel, with James's powder, which, in a few hours, may be followed by the purging mixture, by a dose of jalap and supertartrate of potash, or by a weak solution of salts. If the passage of the acrid bile into the stomach and bowels occasion inflammatory irritation of their mucous surface, leeches should be applied, and, if requisite, be followed with a blister on the abdomen. When the biliary secretion is obviously of a morbid kind, and seemingly is of this description, notwithstanding the repeated use of purgatives and other evacuants, then calomel, or some other mercurial preparation, should be given in full doses at bed-time, with a view of changing the secretions of the liver, and effecting a healthy flow of bile, and be followed by an aperient draught in the morning, in order to carry off the secretions and fecal materials which may have accumulated during the night, and which, if allowed to remain in the cells of the colon, may be productive of disorder and inflammatory irritation of the mucous coat of that bowel. If the mouth should become affected under this treatment,—which frequently happens when it has been preceded by depletions,—a healthy state of function of the liver is the more likely to

supervene speedily; but to affect the mouth should not be our object, for reasons already stated in our Sketches of the Diseases of India.*

It has not infrequently happened to us to observe, that the sudden flow of morbid bile into the duodenum has been productive, in some habits and constitutions, and in the weak and debilitated particularly, of much disorder, attended with a sense of syncope, great coldness of the surface, frequent retchings, and irregularity of the functions of the heart. In such cases, draughts composed of the spiritus ammoniæ aromaticus with the spiritus ætheris nitrosi, or medicines of a similar nature, in some camphor mixture or aromatic water, until the more urgent symptoms were subdued, have proved most serviceable in our practice. To these medicines we have frequently added some of the tinctura opii, in doses according to the particular circumstances of the cases for which it was prescribed. When the more violent symptoms were removed, the expulsion of the cause of disorder was then the object kept in view; and it was generally attempted by the more gentle means which aperients, combined with antispasmodics and diluents, readily afforded. In many cases of this description, the exhibition of very hot fomentations to the epigastric region, and the injection of an emollient and anodyne enema, have proved very beneficial; but after the more urgent symptoms are overcome in these cases, care should be taken not to allow the morbid secretions—the cause of disorder—to accumulate in the alimentary canal. With a view to their expulsion, and to the obtaining a healthy state of the hepatic functions, full doses of calomel should be given at bed-time, and be followed by an aperient draught in the morning, until the motions assume a healthy character, and until the tongue and mouth of the patient are of a natural appearance, and the pulse and general aspect assume their usual state.

It will, however, sometimes happen, that mild purgatives, or even strong cathartics, will not act sufficiently in such cases. When this is observed, they should be assisted by injections, and the exhibition of the purgatives by the mouth persisted in. If, however, the purgatives are of a heating and irritating

* See pp. 291, 292, 385, 386.

nature, the frequent repetition of them, without allowing sufficient time for their operation, may add to the distress of the patient. This should be guarded against. A large dose of calomel, followed by castor oil, or by the common black draught, rendered more active by the addition of a bitter and a little tincture of jalap, has always answered the purpose in our practice, when assisted by a purgative enema, or when repeated according as circumstances required. When the disorder is increased by the retention of morbid accumulations in the bowels, the frequent and regular action of tonic laxatives is indispensable as long as the stools continue morbid, and should not be laid aside from a fear of debility. The operation of aperients should be judged of by their effects and the state of the motions, which ought, in every case, to be carefully examined and watched, and not by the quantity taken, or the frequency of their exhibition. When, however, we have symptoms of inflammatory action of the mucous surface of the bowels present, we should then be extremely cautious in the exhibition of purgatives, and should assiduously endeavour to discriminate between the disordered state of bowels proceeding from inflammatory action, and that arising from the retention of disordered secretions or other matters; but this topic will be fully considered hereafter.

In those cases where the determination of blood to the substance of the liver and adjoining viscera seems to be considerable, and where the congestion of the blood-vessels and engorged state of the biliary ducts and gall-bladder create much disturbance and febrile commotion of the system, either from the undue retention of the bile in these situations, or from its sudden discharge into the alimentary canal, in addition to the depletory and antiphlogistic means already adduced, saline mixtures, with the liquor ammoniæ acetatis, or the carbonates of the fixed alkalies and lime-juice, or the citric acid, may be given through the day, calomel being exhibited at night, and an aperient draught early the following morning. In many cases the liquor antimonii tartarizati may be given with advantage in conjunction with the saline mixture, in order to determine their effects more fully to the skin, particularly if symptomatic fever is present; and in other instances, the spiritus ætheris nitrici will be prescribed with advantage.

Where we have evidence of an increased secretion of bile being the result of general febrile commotion, with active determination of blood to the liver, as in cases of inflammatory bilious fever, or bilious remittent fever, vascular depletion, as we shall have to shew when we come to treat of those disorders, is requisite. But we often observe in practice, in warm countries, and in warm seasons in our own country, but particularly in India, evidence of an increased flow of blood to the liver occasioning a copious formation of bile; and this sometimes of a morbid character, without any febrile condition of the system, but with every appearance of tolerable health, and with a perfectly unimpaired appetite. Indeed, the appetite is even more than usually good, and the patient more than prudently disposed to indulge in it. There is also present much thirst, and an irregular state of the bowels. In such cases, although vascular depletion would be beneficial, the patient is far from thinking it necessary. The better mode of treatment is to abridge his diet; to deprive him of a considerable share of the animal food and highly-seasoned dishes in which such patients generally indulge; to diminish most decidedly his daily allotment of wine; and to give cooling aperients in order to keep up a gentle action on the bowels. Where the increased determination of blood to the liver, resulting either from too rich or too stimulating food, or from great heat or other circumstances of the climate, gives rise, in addition to the disorder of the biliary secretion, to fulness in the situation of the viscus, or in the epigastric region, or to pain or uneasiness even in the least degree, blood-letting, either general or local, ought to be instituted with promptitude and decision, until all symptoms of uneasy feeling disappear, and the biliary secretion be reduced in quantity, or improved in quality. The other antiphlogistic measures usually adopted should also be put in practice, in order to arrest the existing disorder, which may be converted in a few hours into active inflammation and commencing abscess.

In all cases of increased or morbid secretion of bile, or this state conjoined with accumulations of it in the biliary organs, or with copious irruptions of the secretions into the alimentary canal, not only the treatment should be evacuant and depletory, or, to use another word, antiphlogistic, but the diet and regimen ought also to be of a similar kind. The patient

suffering a severe attack of any of the above disorders should abstain from animal food and highly-seasoned dishes, and restrict himself chiefly to vegetable and farinaceous diet. In the less severe attacks, small quantities of weak soups, or of fish, or of white-fleshed animal meat, may be taken occasionally; and cooling diluents, as the imperial drink, lemonade, or water made agreeable by the addition of a few drops of nitric acid, or of the nitro-muriatic acids, should be adopted, until the functions of the liver and digestive organs assume their natural state.

With respect to the treatment of *vascular congestion* of the liver, but little need be advanced beyond what has now been stated. Where the symptoms of congestion of this viscus are decided, and when it may be therefore considered that the vascular turgescence is great, active, general, or local depletion, or both, ought to be put in practice; and the practitioner should not be deterred from the operation by the state of the pulse in such cases: for although often slow, weak, or oppressed, it generally rises upon the free flow of the blood, owing to the removal of the load which weighed down the vital power of the organ. In such cases, a blister over the epigastrium and abdomen assists the beneficial operation of depletion, and with active purgation, and the other means already stated, soon restores the healthy actions of the organ.

In many cases of active congestion of the liver, the inflammatory condition of the organ soon supervenes. This seems frequently to arise from the sudden engorgement of the vessels occasioning great distension of the substance of the viscus, and of its serous surfaces. Hence the pain felt in different parts of the region of the liver, the frequent disturbance of the pulse, and the disorder of the functions of the stomach, &c. Hence also the sudden super-vention of all the symptoms. This state of the organ is both more alarming in its symptoms, and more dangerous as respects its issue, than even a moderate attack of active inflammation: for the quickness with which the engorgement of the organ is produced, evinces great power in the efficient cause of disorder; and, owing to the rapid change in the relative condition of the viscus, great risk to the various parts of which it is composed. Inflammatory re-action, also, is more apt to supervene to this state of extreme

congestion ; and, when so supervening, its progress is both rapid, and the height to which it advances very great. Under such circumstances, depletions, both general and local, ought to be promptly and decidedly put in practice : and as nothing tends more than emulging the biliary ducts to overcome that state of engorgement of both them and the gall-bladder which frequently co-exists with venous congestion, and heightens its severity and danger, full doses of calomel, with or without opium, according to the state of the stomach, ought to be immediately exhibited, and be followed, in a few hours, by a cathartic draught : and if a full operation be not soon afterwards produced, a purgative enema should be thrown well up. In many cases of congestion, an emetic will be given with much advantage, after depletions have been practised ; and in some cases, where the congestion is but slight, and the disturbance of the digestive organs apparently more the consequence of accumulations of bile in the gall-ducts and bladder, the exhibition of an emetic, and even its repetition, will be attended with advantage. In the more severe cases, however, of congestion, emetics are of doubtful benefit, unless copious depletions have been previously instituted, and the retention of a morbid and accumulated bile requires their exhibition. In every case of congestion of the liver, whether slight or otherwise, the practitioner ought to recollect that it generally is that state of the organ which originates the various forms of inflammation, and that abscess may quickly form after the supervention of inflammation upon the congested state, as seems to be proved by the history of many of the cases which will be detailed when we come to treat of inflammations and abscess of the liver.

With respect to the other means of cure, and as to the diet and regimen proper in this form of disorder, we have nothing farther to add to what has been advanced in the preceding parts of this chapter, and in our observations on the treatment of disorders of the stomach.

The following cases will illustrate many of the precepts which we have here inculcated ; and will shew, moreover, the intimate connexion existing between the states of functional disorder which we have endeavoured to illustrate in the foregoing sections.

CASE XLIV. — *Active Congestion of the Liver, with copious Discharge of Acrid Bile.*

HENRY HOARE, recruit, just arrived : admitted into the General Hospital 13th August, at half-past seven o'clock, P.M. having been ill since twelve o'clock, by his own account. He complains of severe pain in his belly, about the umbilicus. Has had frequent vomiting and purging of a bilious watery fluid ; skin not cold ; pulse tolerably good, rather oppressed. — V. S. $\bar{\text{z}}$ xxjv. immediately ; calom. gr. xx. ; opii puri, gr. ijss. ft. pilul. iij. statim sum. R Aquæ ammon. m xxx. ; spirit. æther. vitriol. m xxx. ; mist. amar. cum sennâ, $\bar{\text{z}}$ ij. M. ft. haust. statim capiend. Apply eighteen leeches to the pit of the stomach.

9 o'Clock, P.M. — Feels much relieved ; pulse good ; skin warm. — Dilute nitric acid-drink at pleasure.

11 o'Clock, P.M. — Fast asleep, and breathes with perfect ease.

14th. — Free from all complaints of every kind ; has been very well purged ; stools of a dark colour. — Calom. gr. xx. h. s. s.

15th. — No pain ; skin natural ; pulse good ; stools very dark coloured. — Mist. purg. $\bar{\text{z}}$ ij. statim.

17th. — Discharged, perfectly recovered.

Remarks. — The decided treatment in this case quickly arrested the disorder, and prevented the supervention of acute or sub-acute inflammatory action upon the congested state of the vessels. The copious discharge of acrid bile occasioned the pain and disorder of the alimentary canal, and which disappeared as soon as the morbid bile was dislodged.

CASE XLV. — *Active Congestion of the Liver, with Gastro-intestinal Irritation, quickly removed by active Depletion, &c.*

WILLIAM LOUCH, recruit, admitted at the same time and the same evening that Hoare was received, with acute pain in the epigastric region. Was attacked in the afternoon with vomiting and purging of bitter watery fluid ; skin warm ; pulse very quick, full, and strong. Had twenty grains of calomel before he came to the Hospital, and the following draught. — R Spirit. æther. vitriol. m xxx. ; aquæ ammon. m xxx. ; mist. amar. cum sennâ, $\bar{\text{z}}$ ij. M. ft. haust. V. S. $\bar{\text{z}}$ xl. statim. He vomited after bleeding, and threw up a great quantity of meat and other things which he had been eating, with some bile. — Apply eighteen leeches to the epigastric region, and give the enema purgans. The enema was immediately returned, unchanged in appearance.

Half-past Eight o'Clock.—Repet. enema. Calom. gr. xx.; opii puri, gr. ij.

Nine o'Clock.—The enema produced some effect, and brought away something like feculent matter, but so trifling it is almost unworthy of notice.

Eleven o'Clock, P.M.—Fast asleep.

14th.—Passed a good night, and has no pain of any kind.—Mist. purg. ℥iij., ol. menth. pip. ℥iij.

Evening.—Has been well purged, and is perfectly free from all complaints; pulse and skin natural.—Calom. gr. xx. h. s. s. Haust. amar. cum sennâ, ℥ij. night and morning, which was continued till the 19th, when he was quite well, and discharged.

Remarks.—The congestion of the liver, and copious discharge of bile into a loaded stomach and alimentary canal, appears to have been here the chief cause of disorder.

CASE XLVI.—*Active Congestion, arrested by Bleeding and Purging.*

J. BALLINTINE, recruit, admitted 15th August, at 2 o'clock, A.M. Complains of severe pain across his stomach, and slight headach; no vomiting or purging, but has great sickness at stomach. He was bled by the garrison assistant-surgeon to 3lb. and took twenty grains of calomel before he left the fort: the skin is cold; tongue foul; pulse quick, but not full; pain in his belly continues severe.—Enema purg. statim. Apply sixteen leeches immediately, and give the following draught:—Tinct. amar. ℥ss.; aquæ puræ, ℥j. M.

16th.—Pulse oppressed; skin warm; tongue excited; feels great oppression in his breathing.—R Infus. amar. cum sennâ, ℥ij.; aquæ ammon. ℥xxx.; spirit. æther. vitriol. ℥xxx.; magnes. vitriol. ℥iij. M. ft. haust. statim. Enema purgans. Apply twelve leeches to the spine, in the region of the liver, and twelve to the epigastric region. Acid drinks.

Evening.—Much relieved by the leeches; breathes with perfect ease; feels thirsty; has been well purged.—Mist. salin. febrif. Calomel. gr. xij. h. s.

17th.—Feels much better; no headach or pain any where; tongue clean.—Mist. purg.; mist. salin. febrif.

18th.—Quite well.—Repet. mist. purgans.

20th.—Discharged, perfectly recovered.

Remarks.—This case satisfactorily proves the great advantage resulting from active depletion in new comers to a warm climate, when labouring under symptoms of congestion in the liver. The repeated operation of purgatives, in order to remove all morbid accumulations, and of saline diaphoretics, was also serviceable in this case.

CASE XLVII. — *Active Vascular Congestion of the Liver, with Accumulations of Bile, removed by Blood-letting and Purging.*

PATRICK REID, ætat. 19, Bengal recruit, admitted August 22d, 1819, at half-past nine o'clock, P.M. with acute pain at the scrobiculus cordis, and purging of brown-coloured stools. Had no vomiting or sickness; seized with syncope at the time of bleeding by the surgeon in the fort, and he could take only $\bar{3}$ j. of blood; took the usual draught for cholera, with calomel; pulse 60 in a minute, and good; skin quite natural; complains of thirst; tongue moist; purging seized him about 3 o'clock, P.M. and the pain at 7 o'clock, P.M. — Apply fifteen leeches over the stomach.

Ten o'Clock, P.M. — Says the pain is diminished, and will not have the leeches on. — R Mist. purg. $\bar{3}$ ij. primò mane.

23d. — Tongue excited; eyes rather red; face flushed; considerable thirst; has no pain in his head or in his stomach; skin cool and moist; pulse peculiarly full, soft, and strong, 54 in a minute, and beats very regularly. — V. S. ad $\bar{3}$ xxjv.; mist. purg. $\bar{3}$ ij.; mist. salin. febrif. cum antim. tart. gr. ij. Pulse became 84 immediately after bleeding, firm and regular; just voided a dark bilious stool.

Vespere. — Has had seven dark-coloured stools, and feculent; feels much better; pulse 80, and regular; skin natural; says he is very thirsty; tongue rather white. — Sumat calom. gr. xx. h. s. Repet. haust. purg. mane.

24th. — Says he feels quite well; tongue quite clean; pulse only 50, and firm, but not hard, sharp, or full; skin natural. — Medicine taken this moment.

Vespere. — Bowels freely opened; stools of a yellow colour; feels quite easy; pulse 60, and regular. — No medicine.

25th. — Pulse soft, full, irregular, 64 in a minute; tongue excited; no pain of any kind; bowels rather bound. — Mist purg.

Vespere. — Pulse not so irregular this evening; feels easy; stools of a yellow colour. — Repet. mist. purg. mane.

26th. — Pulse 56, and not so regular as by last report; tongue rather foul; skin natural. — Took his medicine.

27th. — Feels very well this morning; pulse good, 58 in a minute, and has no pain. — No medicine.

28th. — Pulse 54, regular; feels quite well. — No medicine.

29th. — Pulse 64. — No medicine. 30th. — Pulse 68.

31st. — Pulse 70; quite well. — Discharged.

Remarks.—The pain felt in this case evidently proceeded from the great distension of the organ, and stretching of its surface by the congestion of blood in its substance. The slowness of the pulse was here distinctive of the great extent of congestion; and occurring in a new comer to the climate, required decided depletion. As the congestion and accumulation of morbid bile were removed, so the pulse rose to its natural standard.

CASE XLVIII.—*Active Congestion and Accumulation of Bile, Headach, &c. in a Patient recently arrived in a Warm Climate, treated by copious Depletion, &c.*

WILLIAM UNDERWOOD, Honourable Company recruit, ætat. 19, admitted 14th August, 1819, at four o'clock, P.M. Complains of severe pain in the head; also of pain and uneasiness at the pit of his stomach. Had no stools since morning; no vomiting, but complains of sickness; feels very light and giddy; tongue foul; skin hot; pulse very sharp and hard; has cramp in his legs; countenance full and bloated.—R Calom. gr. xx. statim. R Enema purg. V. S. ℥xxxij. Apply eighteen leeches to his stomach. Voided about ℥xij. of urine while bleeding.

Half-past Five o'Clock.—Feels much easier; head painful.—Tinct. amar. ℥jss; aquæ puræ, ℥j. M. ft. haust. stat. Apply eight leeches to each temple.

Eight o'Clock.—R Enema purg.

Eleven o'Clock.—R Tinct. amar. ℥jss.; aquæ puræ, ℥j. M. ft. haust. stat. capiend.

15th.—Pulse good; thirst less; tongue clean; skin warm; countenance natural; has taken the purging mixture, but it has not operated; what little has passed, is marked with bile.—Enema purg.; acid. nitros. pro potu.

Nine o'Clock, A.M.—The enema has brought away a great deal of broken fæces, of a very dark-green colour, mixed with dark-brown, viscid, tenacious matter.—Pulv. purg. statim.

Evening.—Much better.—Calom. gr. x.; opii, gr. j. h. s. s.

16th.—Feels giddiness in his head; pulse sharp; tongue foul; continued sickness, and bitter taste in his mouth.—Mist. purg. ℥ijj. statim. Apply a blister to the back of his neck.

Evening.—R Calom. gr. x. h. s. s.

17th.—Pulse quick and sharp; tongue covered with yellow crust; had some pain in his breast in the night, which is now gone, but his head is giddy.—Mist. purg. Apply ten leeches to each temple.

Evening.—R Calom. gr. x. h. s. s. Pulv. antim. gr. iij. M.

18th.—Has giddiness in his head still; tongue covered with yellow crust; stools black and viscid, with some green matter.—Cont. mist. purg.; enema purg.; mist. salin. febrif. cum antim. tart. gr. ij.

Evening.—Headach continues.—Apply eighteen leeches to the back of the head.

19th.—Much better this morning; tongue very foul; a very bitter taste in his mouth.—Mist. emet.

Evening.—Vomited green bile.—Cont. mist. salin.

20th.—No pain at all in his head; mouth sore; tongue yellow.—Pulv. purg.; acid. nitros. dilut. pro potu.—*Evening.* Continue acid drink.

21st.—Tongue excessively foul; no pain; bowels open.—Acid drink. Pulv. purg.

Evening.—Feels much stronger.

22d and 23d.—Stools copious, and more natural.—Cont. pulv. purg. and acid drink. Cont. acid. potu. No other medicine.

24th.—Haust. aper. Cont. acid.—*Evening.* Discharged, quite well.

Remarks.—This was evidently a case of vascular turgescence of the liver; but whether it was the fulness of simple congestion, with accumulation of bile, or of active determination of blood, occasioning an increased secretion of morbid bile, it is difficult to decide. In either case the treatment was appropriate and successful. The nitric acid drink was here beneficial, as soon as the more urgent symptoms were subdued.

With regard to the treatment of that form of disorder which we have denominated *torpor of the functions of the liver*, unconnected with chronic disease of the viscus, the exhibition of full doses of calomel at bed-time, followed by the bitter aperient medicine in the morning, has generally appeared to us to be most beneficial. Blisters over the epigastrium or hypochondriac regions, and repeated at intervals, are often serviceable. After the treatment has been conducted as above for a few days, the pilul. hydrarg. combined with the pilul. aloët. cum myrrhâ, given at bed-time, and the bitter aperient draught in the morning, has generally effected a perfect restoration of the biliary actions to a healthy state. In this form of disordered function, we have frequently exhibited the nitro-muriatic acids internally, and applied them in the form of the usual wash externally, over the hypochondriac and epigastric regions, night and morning, with the most decided advantage. After blistering has been had recourse to, much advantage has seemed to

us to result from the continued application, over the epigastrium or right hypochondriac region, of a plaster, consisting of the emplastrum picis comp. and emplastrum hydrargyri, or the emplastrum ammoniaci cum hydrargyro, in equal proportions, or in the proportion of two parts of the former to one of the latter. In cases of torpor of the liver, unconnected with congestion of the blood-vessels, or accumulations of bile, gentle tonics, combined with aperients, may be given with benefit; but where the torpor either results from a passive state of congestion and engorgement of the biliary ducts, or when the torpor seems to have produced these states of disorder, tonics would be manifestly injurious, and would lead to the supervention of chronic inflammations of the substance of the organ. Much advantage will be derived, in cases of torpor thus complicated, from the continued use of deobstruent aperients and the occasional employment of a full dose of calomel, followed by a cathartic draught, in order to carry off the accumulations of bile formed upon the liver, and the viscid secretions lining the mucous surface of the alimentary canal.

We may here take occasion to remark, that much mischief frequently arises from combating some of the forms of disorder now treated of by stimulants and tonics, in order to rouse the functions of the liver, and counteract the suppositious state of debility by which they are often attended. In cases of increased determination of blood, producing augmented secretion of bile, and in cases of congestion and of engorgement of this secretion in the biliary canals, such treatment rapidly superinduces acute or chronic inflammations, and rapidly hastens organic changes and disorganisation of the substance of the liver. The tendency of the disorders which we have endeavoured to describe, to run on to inflammation, particularly in India, should ever be kept in recollection by the practitioner, and the means which he makes use of to remove them should be the least likely to convert them into this state of morbid action. The following case shews the advantages to be obtained from depletions in the treatment of this form of disorder.

CASE XLIX.—*Obstinate Torpor of the Liver, with Congestion and Affection of the Head, treated by Depletions, &c.*

J. ATKINSON, ætat. 28, sailor, entered September 28, 1820. Admitted this afternoon with irregularity of his bowels, and sense of weight in the hepatic region; appetite much impaired; great thirst; tongue excited, but moist; countenance sallow; pulse firm, but not full; heat natural; complaints of three weeks' standing.—R Calomel. gr. x.; opii, gr. j.; cons. rosæ, q. s. Ft. pilul. h. s. s. R Mist. salin. comp. ℥jss. tertiâ quâque horâ. Light diet.

29th.—Has had no stool since admission; otherwise as yesterday.—Capiat haust. purg. statim. Cont. alia.

Vespere.—Purged very freely; stools feculent, very light coloured, and very fœtid; pulse rather small; skin cool, with a degree of clamminess; tongue excited and moist; thirst urgent; says he feels rather easier.—Repet. pilul. ij. ut suprâ, h. s. Cont. alia.

30th.—Stools as before, but extremely copious; he complains of the uneasiness in the hepatic region having increased since last evening; no particular fulness in the epigastrium; pulse still rather small, but not oppressed; skin clammy; tongue furred, and white; thirst continues; the uneasiness in his side is increased on pressure, or when he takes a full inspiration.—Repet. haust. purg. statim. App. hirud. xv. hepatis regioni.

Vespere.—Alvine evacuations continue extremely offensive and perfectly light coloured, and feculent; the pain is relieved by the leeches; pulse firmer; skin pretty natural; tongue the same; countenance very sallow, and his eyes are somewhat sunk in their orbits.—R Pilul. aloët. cum calomel. no. 1. ter die. R Mist. amar. cum sennâ, ℥iij. nocte maneque. Fetus hepatis regioni.

October 1.—Stools extremely morbid, copious, and offensive, otherwise nearly the same.—Cont. med. ut heri præ.

Vespere.—Complains of pain in his head, which is very severe; pulse soft, pretty firm, and calm; heat natural; eyes still rather sunk in their orbits; and the pain is confined to his forehead; tongue continues furred, rather white, and moist.—App. hirud. vj. utrique tempori. Cont. med.

2d.—Headach very little relieved by the leeches; pulse soft; skin pretty natural; pain in the orbits; side continues perfectly easy; stools continue morbid and extremely copious, but passed quite easy.—Cont. alia.

Vespere.—Medicine purged him freely; stools have very little secretion of bile;

side easy; head relieved; pulse much firmer; skin soft, cool, moist, and more natural; gums swollen, with some ptyalism. — Cont. med. — 3d. Better. — Cont. med.

4th. — No stool; otherwise pretty easy. — Repet. pulv. aper. Cont. alia.

5th. — Medicine purged him copiously, and his stools are very foetid and still rather light coloured. — Cont. med.

6th. — Says he feels pretty easy in every respect; countenance looks more natural; gums tender; head easy, as also his side; stools continue morbid; tongue less excited; pulse pretty good; heat natural. — Cont. med.

7th, 8th, and 9th. — Continued pretty easy; but he complained of occasional headach; pulse rather full; heat natural; countenance much improved. — Repet. pulv. aper. statim. Cont. alia.

10th. — Pulse 80 in the minute, firm, small, and rather sharp. Says he felt a good deal of pain in his head in the night. Skin natural; medicine purged him freely; stools are still light coloured and offensive, extremely copious and feculent; side perfectly relieved; appetite pretty good; some thirst; passed a very restless night; his countenance is still rather sallow; his eyes somewhat sunk, with darkness of the skin round the orbits. — V. S. ad $\frac{3}{4}$ xvj. quàm primùm. The blood came extremely black from his arm; his pulse became soft and pretty regular immediately after the bleeding. R Aloës, $\frac{3}{4}$ ss.; pil. hydr. $\frac{3}{4}$ j.; syr. simp. q. s. Ft. pilul. xxx. Capiat unam ter die. Cont. haust. amar. cum sennâ, ut antea.

Vespere. — Stools rather bilious this evening, but still very offensive; pulse 64, soft, and firm; tongue clean and moist; heat natural; says he feels quite comfortable this evening; the blood has no particular appearance. — Cont. med.

11th. — One copious stool since last evening, of a white colour, intermixed with a bright-yellow fæces, and less offensive; passed a better night; and he felt very little pain in his head since the bleeding; pulse 76, soft, and firm, but somewhat small; countenance looks much better; skin natural; tongue moist, but excited; some ptyalism. — Cont. med.

Vespere. — Has had no stool since last report. Says he feels pain in his left hypochondrium. — Habeat enema domest. App. hirud. x. parti dolenti.

12th. — The pain complained of in the left hypochondrium relieved by the leeches; one stool only since last report, of a light colour, copious, feculent, but no secretion of bile; head perfectly easy; tongue clean and moist; pulse 70, and regular; heat natural. — Cont. med. Capiat mist. purg. $\frac{3}{4}$ ij. statim.

Vespere. — Three stools, of a natural colour, but very offensive; says he feels easy. — Cont. med.

13th. — Much better in every respect; stools nearly natural; appetite unimpaired. — Cont. med. Low diet.

14th. — Continues better; stools highly bilious; tongue moist and clean; pulse and skin natural; side perfectly easy. — Cont. med.

15th. — Stools copious, feculent, fœtid, and tenacious; pulse, skin, and tongue, natural; mouth nearly well; says he feels a very slight pain in his head occasionally. — Repet. pulv. aper. stat. Cont. alia.

16th. — Medicine purged him freely, and his stools are of a natural appearance, but extremely offensive; tongue moist and slightly furred; pulse 70, and regular; skin natural; no thirst; appetite good. — Repet. pulv. aper. Cont. alia.

17th. — Bowels regular. — Cont. med. — 18th. Cont.

19th. — Complains of pain in the top of his head, with vertigo; pulse and skin natural; tongue moist and clean; has had no stool since yesterday evening. — Cont. med. App. hirud. xvj. occipiti; capiat pulv. jalap. compos. ʒj. statim. Cont. alia.

Vespere. — Purged four times; stools foul and offensive; head relieved by the leeches. — Cont. med.; repet. pulv. aper. cras mane. Cont. med.

20th. — Stools copious and pretty natural; pain in his head relieved, but he feels rather giddy; pulse and skin natural; tongue clean and moist. — Cont. med.

21st. — His purgative answered well; stools of a natural colour, but offensive; says he feels quite easy; pulse, skin, and tongue, natural. — Repet. pulv. aper. Omit. alia.

22d. — Medicine purged him freely yesterday; appetite good; stools offensive. — Rept. pulv. aper. stat.

23d, *Vespere.* — Stools light coloured, copious, feculent, and offensive; says he is troubled with griping. — R Calomel. gr. x.; opii, gr. j. Ft. pilul. h. s. s.

24th. — Says he had a restless night; frequent, copious stools; tongue rather furred; pulse and skin natural. — Cap. haust. purgans quàm primùm. Sago for dinner.

Vespere. — Medicine purged him freely; stools feculent and perfectly clay coloured; says he is still troubled with flatus. — Repet. pilul. hydr. submur. cum opio, h. s. s. ut heri præs.

25th. — Stools better this morning; says he feels no pain in his right side; pulse soft and calm; tongue furred and moist; great thirst; says he feels occasionally giddiness in his head; still with some pain. — Repet. haust. aper. stat. App. hirudines xv. occipiti. R Mist. salin. compos. ʒjss. tertiâ quâque horâ.

26th. — Head painful all night, but he feels easy this morning, with the exception of vertigo; tongue excited; no sickness at stomach; stools feculent, copious, and

perfectly clay coloured; pulse small, pretty firm, calm; heat natural; great thirst; appetite tolerable. — R Pilul. aloët. cum calomel. no. 1, ter die. R Misturæ amar. cum sennâ, ℥ij.; cum sodâ sulph. ℥ij. M. ft. haust. omni mane.

27th. — Stools copious, feculent, and of a better colour, with a good deal of bile; tongue furred; pulse 60, firm, and soft; somewhat oppressed; says he feels pain at the crown of his head; appetite pretty good; he thinks the bleeding had a better effect than the leeches. — Cont. med. V. S. ad ℥xx.

Vespere. — The blood is cupped, but no appearance of buff; the serum is somewhat of a milky appearance; says he feels much relieved; pulse 80, and regular; skin cool and moist; tongue less excited; stools copious, feculent, and rather offensive. — Cont. med.

28th. — Pulse 78, and regular; skin cool and moist; head easy; tongue moist, but slightly furred; stools feculent, copious, and improving in appearance; no thirst; appetite unimpaired; he complains of his eyes being painful, and they are somewhat inflamed. — Cont. med. R Plumbi superacet. ℥j.; aq. puræ, ℔jss. M. ft. collyr. sæpè utend.

29th. — Stools feculent, rather offensive, and still rather light coloured; says he feels easy; tongue excited; pulse 80, and regular; skin natural; eyes less inflamed. — Cont. med.

30th. — Stools feculent, tenacious, and rather light coloured; says he is free from pain; pulse and skin natural; tongue still rather furred; eyes continue somewhat painful. — Cap. pulv. jalap. com. ℥ij. stat. Cont. alia ut suprâ.

31st. — Stools copious, feculent, very foetid, and of a dark-brown colour; no head-ach; tongue a good deal furred, moist; pulse soft; skin cool. — Cont. med.

November 1st. — Stools assuming a more natural character; tongue cleaner. — Rep. med.

2d. — Continues to improve.

From this time he recovered, and was returned to his ship on the 12th of the month.

Remarks. — In this case the torpor of the liver was unusually great. The continued light-coloured state of his stools led at one time to the supposition that bile was prevented from reaching the alimentary canal by some obstruction in the common duct; and yet bile was occasionally seen in the motions. If the deficiency of it had arisen from obstruction of the common or hepatic duct, the secretion not being interrupted, an accumulation of it would have been the consequence, and the quantity accumulated would have come away as soon as the obstruction was removed. But even when bile did begin to appear in the stools, it was in small quantity, and at no time

exceeded what is usually observed in health. The treatment was directed with the view of re-establishing the functions of the liver, and at the same time of removing congestion. The pain complained of in the head seemed also to have been the result of congestion of the sinuses, and was combated also by depletions and purgatives.

Before we leave this part of our subject, we would impress upon the attention of the practitioner the necessity of instituting free and full purgation in those forms of disorder which depend upon congestion and torpor of the liver. We have already contended for the existence of considerable accumulations of tenacious mucus and feculent matters in the alimentary canal, particularly in the cæcum and cells of the colon, whenever these states of the biliary functions exist. But it is not by means of the simple operation of a purgative or two that such accumulations will be removed. Purgation should, in such cases, be prescribed daily, till the symptoms are relieved and the motions acquire a healthy character. Many practitioners think they have done enough when they have given one or two smart purgatives, and are surprised that more advantage is not obtained from them. They say that they have purged freely, and that there is nothing particular in the appearance of the motions. This may be, in many respects, true; for the motions will often, at first, present but slight appearances of disorder, and yet, after the use of tonic and deobstruent aperients has been properly continued, the extent of accumulation of morbid matters in the alimentary canal, and of disordered bile in the biliary organs, soon becomes apparent in the foul and diseased state of the evacuations. In many cases, the practitioner, as well as the patient, will be greatly surprised at the immense quantity of disordered stools which will be removed in the course of a few days. When the abdomen is full, and furnishes a doughy feel upon examination, particularly in the region of the cæcum and course of the colon, the use of purgatives is indispensable. If, in addition to this state of the abdomen, the stools are offensive, or in any way morbid, — if they are viscid, tenacious, crude, dark coloured, or spinage like, or of a bottle-green tint, the repeated operation of purgatives is imperatively called for. The choice of medicines in such cases is a matter of some moment. In many instances of this kind, particularly when the liver is congested or torpid in function, the exhibition of a full dose of calomel at bed-time, and

of the compound jalap powder in the morning, or the common black draught, will be the most advantageous. After these remedies have been continued for some days — generally five or seven days will be long enough — then the pilul. aloës cum myrrhâ alone, or this with the pilul. hydrarg. may be given every night at bed-time, and a wine-glassful of the mist. amar. cum sennâ early in the morning. This plan should be continued until the motions and digestive functions begin to assume a healthy character, when one only of the foregoing remedies may be given in the twenty-four hours, either at bed-time or early in the morning; or the pills may be taken on alternate nights, and the bitter purging mixture the following morning. These remedies generally produce full, but not frequent evacuations, and they succeed better than saline purgatives in bringing away whatever feculent or other matters may be retained in the cells of the colon. Watery motions ought to be avoided in the disorders under consideration; they merely distress and weaken the patient, without removing the morbid accumulations retained in the alimentary canal and producing disorder. Hence, salts given alone are generally productive of mischief; but when given in small quantities, with senna and bitter infusions, they generally act satisfactorily. When watery motions are frequent and of a dark colour, they shew that there is some other offensive and more solid matter to be brought away, which may itself be the cause of purging, owing to the irritation it occasions in the parts of the intestines where it is lodged.

Debility often accompanies frequent watery motions, and there is often much restlessness, and an irritable state of the pulse. Patients who are distressed with this state of the bowels generally complain that they have been purged continually; and when credit is given to these representations, astringents and cordials are exhibited with a view of supporting their strength; but these often add to the disease and heighten the febrile symptoms. In these cases, the physician should always satisfy his own mind respecting the extent to which the purging complained of has proceeded. If he examine what has been passed, he will find that the numerous stools, which have been the cause of complaint, amount not to a single moderate motion as regards quantity and that, in point of fact, the patient has not been purged at all;

the irritation and inclination to stool being mistaken for actual purging. The practitioner must take care not to be misled by such representations, and, notwithstanding the irritation and tenesmus which deceive the patient, full evacuations ought to be attempted by the means we have recommended for the purpose, assisted by such injections as are calculated to soothe the irritation of the rectum and sigmoid flexure of the colon, which occasions the small, inefficient, and deceptive stools. In no case should a practitioner take charge of a patient labouring under any of the disorders of the liver which have been now treated of, without examining the state of the motions daily and attentively. The appearances which these afford will readily indicate when opening medicines should be prescribed, and when they may be dispensed with. When it is necessary to keep up a laxative effect upon the bowels, in order to remove matters which have accumulated in them, without occasioning any directly debilitating influence from the operation, or exciting any increased action upon the mucous surface, the gentler aperients and tonic laxatives should be preferred. These ought to be prescribed daily for a considerable time; and on every fourth or fifth day a brisk cathartic may be exhibited, in order to carry off those matters which the laxatives have failed to remove. The advantages which belong respectively to cathartics, purgatives, and laxatives, are seldom sufficiently considered by practitioners. Hence these medicines are frequently employed too indiscriminately and inadequately, and they consequently prove either inefficient or detrimental on some occasions; and thus, what has been called the purgative plan of cure has been improperly stigmatised. When we come to treat of the disorders of the larger intestines, we shall take occasion to enter more fully into this subject.

CHAPTER II.

OF INFLAMMATIONS OF THE LIVER, AND THEIR MORE FREQUENT TERMINATIONS IN WARM CLIMATES, PARTICULARLY IN INDIA, &c.

IN the observations we have made respecting the more frequent functional disorders of the liver in warm climates, we have endeavoured to illustrate these disorders in their more simple and less complicated forms, and as giving rise to all the other derangements observed to accompany them, short of occasioning disease of a more determinate and specific kind. This mode of considering the subject seemed to us preferable, inasmuch as those more dangerous and violent forms of disease which we have to consider hereafter, and which are often accompanied with functional disorders of the liver, would be the better understood from the attention previously paid to this particular part of our subject. Besides, many of those more severe and fatal diseases to which Europeans are liable in a high range of temperature, originate in disturbances occasioned in the healthy functions of the biliary organs. The history of many cases of fever, dysentery, and diarrhœa, proves this position, as we shall have to shew in the sequel; and the remarks which we shall have to make in the following sections of this chapter will satisfactorily shew the frequent dependence of the different degrees of inflammation of the liver upon those disorders of the viscus which have now been discussed.

In many cases, inflammation of this very important organ will be ushered in by an increased secretion of bile, marking the dependence of such increase upon augmented determination of blood to the secreting substance of the viscus, as we have shewn in a previous section. In this case the

increased afflux of blood runs on to active inflammation of the substance of the organ; and as inflammation, when originating in this manner, is often imperfectly and obscurely characterised by symptoms, or by the usually accompanying signs of vascular action, abscess frequently supervenes before the real state of disorder is detected. Such cases are often met with amongst those patients which, in public practice within the tropics, and particularly in India, are admitted with the more prominent symptoms of fever or of dysentery; the disordered biliary secretion, resulting from increased determination of blood to, or inflammation of, the substance of the liver, occasioning the febrile or dysenteric symptoms, the urgency of which attracts the patient's whole attention, masks the real source of mischief, and misleads the unwary or inattentive practitioner.

In other instances, the accumulation of bile upon the substance of the liver, and its acrid and stimulating properties, become a source of irritation, and kindles up that inflammatory action which the organ is already but too prone to undergo. And this result is still more to be dreaded, if, along with the accumulation of morbid bile, there also exist any degree of congestion of the blood-vessels,—a coincidence which may be considered as very generally obtaining.

As to the very frequent supervention of inflammation upon congestion of blood in the vessels of the liver, there can, in our opinion, be but little doubt. The knowledge of the connexion subsisting between both states of disorder is important, inasmuch as a suspicion even of the existence of congestion ought to lead us to the adoption of such remedies as should prevent the supervention of consequences so much to be dreaded as inflammation and abscess of the substance of the liver. What these measures are, we have already endeavoured to shew. When, however, inflammation commences, as it frequently does, either in congestion of the blood-vessels of the organ, or in accumulations of acrid bile in the biliary ducts,—owing to the slight degree of disorder such states frequently occasion to the feelings of the patient, it seldom comes under the observation of the practitioner until the inflammatory action is very far advanced; and the derangements from

which it originates are still less frequently the subjects of his notice, — they are the preliminary states of disorder, which, particularly when supervening slowly, excite no alarm in the patient until their consequences are fully effected, or have reached that state which is beyond the powers of science and art.

From these brief remarks, it may be seen that we consider inflammations of the liver as very generally the consequences of some one or more of the functional derangements of the viscus which have engaged our attention in the preceding chapter; and that when hepatitis does not actually proceed from these disorders as a direct consequence, it generally arises from the state of predisposition to inflammatory action, which functional disorders of the liver invariably generate. This is the conviction on our minds, and is the result of a long and extensive experience; and we here particularly direct the attention of both the practitioner and the patient to the subject, for the purpose of obtaining from them a due degree of regard to those more slight ailments, of which the importance consists chiefly in their consequences, even when the least alarming as regards their immediate essence, and the symptoms by which they are indicated.

SECTION I.

Of the Nature, Symptoms, and Causes of Inflammations of the Liver.

INFLAMMATION of the liver generally supervenes either as a primary disease, without any very apparent state of previous disorder, or as a consequence of one or more of the functional derangements to which we now have directed the attention of the practitioner. This latter mode of commencement appears to us the most common within the tropics, and particularly in India, and is frequently to be recognised in those cases of hepatitis which supervene upon intermittent, remittent, and continued fevers, and dysentery.

In many instances the functional disorder ushering in the well-marked inflammatory state of the organ may not be attended to on the part of the patient, and may not come under the observation of the physician until the hepatitis is fully formed, or even advanced to some one of its usual terminations,—namely, abscess, chronic enlargement, &c. Even acute inflammation may commence primarily, and proceed for a number of days without producing so much disturbance or alarm to the patient as to induce him to apply for professional assistance. This is still more remarkably the case, as we shall see in the sequel, where the substance of the organ is the seat of the inflammation, when the danger of neglect is greatly augmented by the very ready disposition of inflammation of this structure to run into abscess. Hepatitis may, therefore, originate primarily without previous disorder; or it may supervene to functional derangement of longer or shorter duration.

But it is not only important to be aware of the mode in which hepatitis supervenes,—the practitioner should also bear in mind that it will differ very widely in its form, symptoms, and consequences, according to the particular part of the organ which is affected, and the extent to which the inflammatory action extends itself to adjoining parts. The signs, however, which indicate the existence of inflammatory action in any one particular part of the liver, and its limitation to that part, or its extension to other parts and different structures, are seldom so precise, or admit so very rarely of an obvious connexion with its real seat and extent, that the most experienced practitioner cannot take upon himself to state the symptoms which are pathognomonic of inflammation of a particular part of this organ, in all cases and under every circumstance. He may, however, point out the phenomena which his experience has authorised him to consider as most frequently the result of inflammation of a certain surface or part of the viscus; but he can only offer them as an approximation to the truth, which an intimate observation, and various contingent and often indescribable circumstances in the history and existing state of a patient, viewed in connexion with these more definite signs, will enable the enlightened physician very nearly to approach.

Before we attempt to touch upon this very difficult topic, namely, the signs by which inflammation of the liver is to be recognised, under the different circumstances in which it will be observed in intertropical practice, and by which we may rationally infer its limitation or extension to particular parts and textures, we shall endeavour to state succinctly the appearances which this very important organ presents in the inflamed state, and remark upon some of the various organic changes which more usually supervene to it, or with which it is most frequently complicated. As, however, we intend to devote a section to the consideration of the pathology of abscess of the liver, we shall avoid, at this place, the consideration of such points as relate more intimately to that subject.

Inflammation of the liver may be limited to the following parts of the organ, namely; the superior or convex surface, the inferior or concave surface, the internal or parenchymatous structure, and the right or left lobe. The right lobe is most generally the seat of inflammation: both the right and left lobes are met with in an inflamed state at the same time, next in frequency; and the left lobe alone is the least liable to inflammatory action. Frequently the inflammation, particularly when seated in the superior surface of the organ, is limited by the broad ligament. When the surfaces are the seat of inflammatory action, the adjoining internal structure of the organ generally participates in it to a greater or less extent; and likewise when morbid vascular action commences in the parenchymatous structure, it sometimes extends to the external surface; but this more rarely occurs in India than the former mode of extension: the internal structure appearing to us to be more frequently the seat of the inflammatory state than the surfaces, which seldom participate in it until the more advanced stages of the disease. Sometimes, however, the inflammation of the liver may arise from the extension of morbid vascular action from an adjoining viscus, as from the stomach or duodenum; and in such cases the surfaces first become the seat of disease, which generally soon extends itself to the internal structure of the organ. When inflammation either attacks primarily the surfaces, or is extended to them secondarily, coagulable lymph is generally effused from them; but in such cases the peritoneal covering must be, or have been,

actually inflamed; for the parts immediately subjacent to it will present every mark of increased vascular action, and yet the investing membrane will itself not be the seat of inflammatory action, to the extent, at least, of throwing out coagulable lymph. We frequently observe in India the internal structure of the liver inflamed to the greatest possible extent, without any effusion of lymph from its surfaces; and the inflammation of structure may go on to the production of several abscesses in both its lobes, or of one very large abscess in the right lobe only, without any decided marks of inflammation of the envelop of the organ, besides some alterations of colour merely, which shades of colour are usually occasioned by the states of the parts immediately underneath. Nay, even abscesses of the liver may proceed to their utmost extent, and ultimately break into the abdominal cavity, without having induced inflammation of the serous surface where they point, and, consequently, without forming adhesions to the parts with which they are in immediate and most close contact. In proof of these facts we may refer our readers to the plates accompanying this work, amongst which, however, he will find some illustrating a different occurrence, as we shall have to shew fully when the consideration of abscess of the liver is entered upon.

In many cases of inflammatory disease obviously affecting the stomach and biliary organs, it is very difficult to determine, from want of an account of their early progress, whether or no the inflammation commenced in the stomach, and extended itself to the biliary organs; or whether it began in the latter, and spread to the former. Such complications of disease are by no means uncommon in warm climates, and especially in India; and whether they terminate favourably or the reverse, the question cannot often be decided. When they end in death, either from the extent of disease in these particular organs, or from its extension to other adjoining viscera, we generally find, as we shall have occasion more particularly to point out, the liver most remarkably diseased, or even the viscera, which were the last to undergo the morbid action; the stomach, which, although the first to evince disorder, presenting the least marks of it upon dissection. This very frequent, and indeed general, course of morbid phenomena, at least as respects the

East Indies, may be very easily explained, even upon the supposition that the stomach was the organ which first became disordered, as no doubt is the case in many instances; for disease, when it has extended to an adjoining organ, often becomes diminished in its original seat; and in cases where this is not the result, and where the superinduced disorder of the liver has led to still farther disease in the alimentary canal, owing to the morbid state of the secretions, the latest derangement in the chain of morbid phenomena not infrequently mitigates, even when it fails of entirely removing, the originating malady. Illustrations of the above position are frequently observed by the intertropical practitioner, more particularly the military surgeon. He will often have occasion to remark, in soldiers, more especially those who are addicted to the inordinate use of spirituous liquors, that the functions of the stomach are amongst the earliest to suffer,—that this organ will present the signs of disordered function or of inflammatory action, and to them will supervene those of deranged secretion of bile, or of inflammation of the liver,—that the usual symptoms of dysentery also will be often added to the foregoing derangements,—that the signs of inflammation of the stomach will gradually disappear as the dysenteric disorder increases,—and that, if the complication terminate in death, the large intestines, the seat of the last disorder in the course of morbid phenomena, will present the most remarkable appearances of disease, in which the liver will participate to a greater or less extent; the stomach being the least deranged in its structure of any of the organs betraying disorder during life, although the earliest to suffer, and apparently the longest to endure disease in a very marked and urgent degree.

It would obviously be a great attainment on the part of the practitioner; particularly in intertropical practice, to be able to ascertain the commencement of inflammatory action in the liver, and the precise part in which it is seated. The former is, on many occasions, a point of great difficulty; the latter frequently, if not generally, one of absolute impossibility. Indeed, it is not until after many years of varied and extensive experience of this disease, that the practitioner becomes enabled to decide, with any degree approaching certainty, respecting even the organ which is disordered in the earliest stages

of complaint; and even after all his observation and boasted tact, whether mental or manual, in the discovery of hepatic derangement, he will often be obliged to confess the difficulty of the subject, and see cause for still farther perseverance in the career of close observation which he has been pursuing. This, it will be said, is a humiliating confession; but we make it with a conviction of its truth, and with the still consoling feeling, that the intimate observer and experienced inquirer into the progress and phenomena of disease, will have numerous instances of evincing the commanding fruits of his labours, even at the time when he has occasion to regret that his powers of discrimination have not carried him still farther. He will often have occasion to know that there are cases wherein it is difficult to determine, particularly in the early progress of complaint, whether the stomach, the biliary organs, the duodenum, or the right flexure of the colon,* is the seat of disorder, or the extent to which either the one or the other is affected. This difficulty, it must be admitted, is often owing to fortuitous circumstances; and amongst these may be enumerated, the want of a sufficient information as to the causes of disorder and its early progress; insufficient opportunities of investigating its history and existing state; and the imperfect account which many patients give of their feelings and symptoms. Amongst these difficulties in the way of obtaining a satisfactory knowledge of the existence, extent, and complications of diseases of the liver, particularly of inflammations of this viscus, there is one which respects the practitioner himself. The importance of investigating into every circumstance calculated to throw light upon the seat and nature of a complaint, cannot be impressed upon any person's mind more fully than it generally is upon the mind of the scientific and conscientious practitioner. Such investigation furnishes the basis upon which he has to found all his curative indications; but the practitioner placed at the head of a military or other hospital, wherein he has to see twice or thrice daily, and prescribe for, from 300 to 400 patients labouring under intertropical diseases, with either no assistance, or imperfect assistance, beyond the compounding of the medicines directed by him, will often find it utterly out of his power to accomplish his intention on every

* See the section on the Derangements of the Colon, in Vol. II.

occasion where he is desirous of performing it, more particularly when he has to follow the operations of an army.

Every experienced observer will also readily acknowledge, that, when judging of the seat of disorder and of its extent, he is guided as much by certain appearances, which he cannot satisfactorily describe, and by the relation which various signs and circumstances in the progress and state of a case bear to each other, as by the existence of specific symptoms, upon which many are disposed entirely to rely. Repeated observation has convinced the more experienced practitioner, that even the most prominent signs, when trusted in alone, will often mislead, and that they are chiefly to be relied upon when viewed in connexion with other signs of a less obtrusive nature. This should be kept in view by the medical adviser who has yet to acquire experience of the diseases we are about to consider. While he reposes confidence in those who furnish him with the requisite instruction to enable him to observe and to judge for himself, he should endeavour to procure still more accurate information from his own practice; but, in order to be valuable, it must be obtained from an intimate view of every circumstance which tends to change the usual phenomena, progress, and succession of diseases, or to modify the results.

Before we enter upon a statement of the symptoms indicating inflammations of the liver, we have considered it proper to offer the foregoing observations respecting the very silent, unobtrusive, and insidious manner in which the most dangerous form of inflammation of the liver commences and makes early progress. This has appeared to us the more necessary, as teachers and books have generally furnished the student with certain ideas respecting this disease, which he will only occasionally find to be correct; and if he trust to them uniformly, or even generally, as he is disposed to do until experience teaches him his error, he will be frequently the unconscious cause of most serious neglect, and consequent mischief. The sources of information just alluded to, but too often furnish absolutely, and, with few exceptions, certain symptoms as being characteristic of hepatitis, which either supervene but occasionally, or not until the disease has advanced

almost to its acme. They have but too frequently omitted to state what is very important to be known before the practitioner enters upon the discharge of his practical duties, and left him to learn, but inadequately provided with the requisite assistance, what considerable time and observation, and his errors, only can teach him, when acting on his own judgment, without sufficiently accurate guidance.

When it is not, from the nature of the subject, in the power of a writer to state with precision, or to describe with accuracy, the varying phenomena, contingent signs, and the numerous and daily-changing shades which characterise the state and progress of diseases, and mark their differences, he should make his reader aware of the difficulty, and not mislead him by stating what is true in some cases only, and under certain circumstances, as obtaining on all occasions, or at least with few or no exceptions. But although it is thus necessary, in many instances, to state with reservation, and to describe phenomena as they actually occur, as nearly as our powers of description will enable us, let it not be imagined that even the most obscure inflammations of the liver may not be detected by the careful observer, if he direct his attention with assiduity to the subject. The reason that these diseases have so frequently run their course, even to a fatal termination, and yet have not been detected by the medical attendant until dissection shewed him the extent of structural disease they had produced, is to be ascribed to the circumstances just alluded to; namely, to confident statements of symptoms as pathognomonic of the disease, which symptoms are by no means of constant occurrence; to the neglect of others, which, although less obtrusive, are, when viewed in connexion especially, much more certainly to be depended upon.

Although we have thought it proper to impress the mind of the reader with an idea of the real degree of difficulty which besets the recognition of inflammations of the liver on many occasions, let it not be understood by him that we consider it as insurmountable, in almost any case, by the well-educated and attentive practitioner. The difficulty is entirely the result of the confidence with which certain signs are enumerated by writers and

teachers; and the inexperienced medical man relies upon them until observation shews their frequent fallacy, and convinces him that, as their presence does not uniformly portend inflammation of the liver, in like manner their absence is no proof of its non-existence. Nay, he will further learn from this, the best of all sources of instruction, that those very symptoms on which he has been taught to repose so much confidence, are but seldom present in the very worst forms of this disease, or, if at all, not until they have reached their height, and even then they are occasionally not to be recognised.

But although this fallaciousness of the very signs in which we are taught in early life to trust, is apt to engender ideas unfavourable to exertion and pathological research, and to lead many to doubt of the advantages to be obtained from a rational investigation of symptoms in relation to the actually existing state of disease,—there are others, who, viewing the matter in its true light, will attribute fallacies to their direct source, and will see that the want of accuracy is more to be imputed to the observer than to the nature of the objects observed. They will perceive, that any symptom, when confided in alone, will occasionally mislead; that all the consequent phenomena of disease should be remarked, and the one duly balanced with the other; and that if this be done carefully, and with a judicious discrimination, and a due consideration of such external and internal agents, influences, and circumstances, as modify their manifestations and control their issue, a degree of certainty in the recognition of hepatic diseases may be reached by the practitioner, which will richly repay his labours, and excite him to pursue the study of disease in that way which alone will confer on him both honour and substantial reputation.

But in order to attain to the power of thus discriminating the nature and extent of the most obscure disorders which the practitioner will be called upon to treat in warm climates, much careful examination of the usual symptoms and causes of disease must be instituted; their various relations, with the circumstances wherein they differ, and the reasons of their difference, must be duly weighed during the treatment of the patient; and,

in such cases as terminate fatally, their connexion with organic changes ought to be most assiduously traced by means of *post mortem* research, whenever it can be put in practice. The effects of remedies, also, in changing the usual march of deranged action, should be noted with accuracy, and taken advantage of in their employment; and, on all occasions, the means of counteraction resorted to should be in due relation to the extent of disorder and their previously ascertained mode and power of operation.

It must, nevertheless, be admitted, that there are many difficulties which beset the endeavours of the most experienced practitioner to describe with accuracy the symptoms and progress of the more obscure disorders which he has been in the habit of treating. Although he can state the degree of reliance which may be placed upon certain symptoms, generally considered as pathognomonic of the disease in question, yet he cannot always describe, to his own satisfaction, the subordinate signs and shades of appearances which experience has taught him to rely upon, in conjunction with the more prominent symptoms. The observing practitioner is often guided in his opinion by various slight and evanescent appearances in the state of his patient, and by the manner in which certain symptoms and morbid phenomena are grouped; and he acts according to the impression derived from them. But when he endeavours to convey to others an idea of the sources whence he obtained his knowledge, he finds it much more difficult than he imagined to describe those symptoms which are most uniform in their characters and constant in their appearance; and if he attempt even to sketch the numerous modes in which certain signs are varied, combined, and grouped, according as observation has taught him to confide in them, he will soon discover the almost insurmountable difficulty of his undertaking, and either relinquish it altogether in despair, or merely endeavour to perform it to the best of his ability.

As, however, the most experienced and most industrious practitioner cannot accomplish all that may be wished by others, or even sought after by himself,—and as knowledge is so slowly progressive that very few can advance it, even in their own immediate province, more than a single step, leaving many to those who may come after them,—we shall endeavour to describe the

diseases before us as faithfully as our weak powers will enable us, expecting, if it shall be found that one small step of advancement has been made by us in the particular path which we have been pursuing, that it will prove the cause of adding many more, by means of those who are more competent than ourselves to their satisfactory performance.

We have already observed, that inflammations of the liver frequently originate in some one or more of the functional disorders of this organ, already treated of; and, in such cases, it is very often difficult to ascertain when the inflammatory action commenced; for, during the first period of hepatitis, thus originating, we have seldom any other symptom present than what has already been assigned as characterising functional disorder of the viscus: indeed, the vascular congestion may be considered as a part of the inflammatory process. Hepatitis, also, proceeding from any one or more of these functional derangements, generally commences in the internal structure of the organ, which possesses a very low state of sensibility, and which may be deranged to a very great extent without affecting the system in a manner sufficient to alarm the patient, or even to rouse the attention of the practitioner to the state of this particular organ. In such cases, however, morbid signs will manifest themselves, although they are not always those which are usually stated, and but too often exclusively relied upon.

We have also remarked, that inflammation of the liver may be seated more particularly in some one of its surfaces, or in its internal structure; that the former is not, perhaps, more frequently met with in warm climates than the latter; and that, when the surfaces become inflamed, the substance of the organ generally participates in the disease to a greater or less extent; whilst, on the other hand, when inflammation commences in the internal structure, it may go on to the production of its worst consequences, without any extension of it to the envelops or surface of the organ. From this it may be inferred, that we cannot always determine, even when the symptoms are the most precise, when the inflammation is limited to the surface of the liver, since such limitation is but seldom observed; nor can we ascertain the extent to which the disease may proceed through its substance. But, as such

extension of disease very generally occurs, and is attended with certain appearances, it will be safer to infer its existence whenever these appearances are observed, although they may not be always uniform in their grade, or even universally present.

In order, however, to give greater precision to what we have to state respecting the history of hepatitis, we shall first describe fully the morbid phenomena attendant on this disease, with a particular reference to the symptoms and appearances by which we should be guided in determining the existence of the more active inflammations of the substance of the liver; we shall afterwards offer some reflections on those signs which more particularly characterise inflammation of its surfaces; and conclude the discussion of the subject with some observations on the phenomena which have generally appeared to us to mark inflammation of both structures of this important organ.

Inflammations of the liver have been usually arranged by systematic writers into acute and chronic; the former commencing in the surface of the organ, the latter in its parenchymatous structure. However consonant this division may be to the hepatitis of temperate climates, and however chronic the inflammation of the internal structure of the viscus may there prove, neither this division of the subject, nor the general character here assigned to an important form of the disease, can be extended with justice to the hepatic inflammations of warm climates. Although inflammatory action, commencing in the surface of the viscus, almost always assumes an acute form in these climates, as well as in temperate countries, yet, when seated in the parenchymatous structure, it does not always assume the chronic form, as is very generally observed there. Within the tropics, the most active kind of inflammation of the liver, as respects many of the symptoms characterising the disease, as well as its duration, affects both the substance of the organ and some part of its surface; so that in these climates, at least, acute* hepatitis may commence and be seated in the

* It should be here remarked, that active, acute, and chronic, are merely indefinite and conventional terms, to which more precise ideas should be attached than usually are. In most cases of the diseases under consideration, these terms refer entirely to the violence of the symptoms marking the disorder, and the length of time it is in running its course; but as hepatic inflammations present symptoms of

former structure as well as in the latter, although, perhaps, it more frequently originates in the one, and extends to the other. Chronic inflammation, on the other hand, generally affects the parenchymatous structure only. Thus, acute hepatitis has its seat either in the surface or in the internal structure of the organ, or in both; but it, perhaps, more frequently commences in the former texture; whilst chronic inflammation almost always begins in the latter.

Inflammation of the substance of the liver seldom commences with a well-marked rigor or chill, unless after exposure to a powerful exciting cause operating upon the system from without, as cold or wet, currents of air, night dew, or malaria. When chills or rigors mark commencing inflammation of the internal structure of the organ, there are generally one or more of the symptoms we have enumerated as characterising congestion also present. Indeed, a congested state of the organ about to be diseased always accompanies that particular condition of system which gives rise to rigors, if it does not actually cause this particular phenomenon; and it generally accompanies inflammation of the substance of the organ, to a greater or less extent, throughout its progress. The patient usually complains, about this time, of oppression, weight, and uneasiness about the pit of the stomach and right hypochondrium, extending sometimes under the ensiform cartilage, and in the direction of the diaphragm and mediastinum to the back and shoulder-blades. These symptoms are usually increased upon a full inspiration, taken at the time when pressure is made beneath the ribs, or when pressure upon the stomach and back is made at the same time. The pulse is, at this very early period of the disorder, scarcely affected; but it soon becomes accelerated towards night; it is often slower and more oppressed than usual, and occa-

every grade, from the slightest and least perceptible to the most violent and alarming, and vary in duration from two or three days to as many months or even years, an arbitrary division into active, acute, and chronic, leaves many in doubt to which of these divisions cases betraying intermediate grades of activity ought to be referred. As chronic is, however, a term which relates only to time, it ought not to be applied to those cases of hepatitis which run a rapid progress, merely because they are not characterised by very evident and definite symptoms: such cases are as active or acute, although more insidious, as those which present the most violent symptoms. The reader will consider the term chronic as applied by us in the present work to such cases as are protracted beyond a month before convalescence supervenes, or before the disease gives rise to organic changes of a dangerous nature.

sionally irregular or remittent. The countenance is now usually pale, sallow, or somewhat anxious; the spirits considerably depressed; the tongue yellowish, white, and more or less foul, and the patient complains of loss of appetite and of sickness, with an unpleasant taste in his mouth. The bowels are often irregular, but at first generally costive, and the urine is in small quantity, loaded, and high coloured. There is sometimes headach, and generally a disturbed sleep, and often slight dyspnœa and sighing, with slight oppression at the chest and epigastrium.

As the disease of the internal structure of the liver advances, the pulse becomes quicker, fuller, and more irritable in its beat during the evening and night, and it is often oppressed and embarrassed during the morning and day, and sometimes throughout, unless copious depletions have been practised early in the disorder; the sense of uneasiness in the region of the liver and epigastrium is often augmented; and if vascular fulness of the organ be great, and particularly when the inflammation results from congestion, the patient complains of a heavy, dragging pain, increased on sudden motion, or by turning suddenly in bed. There is often a short, suppressed cough, dyspnœa, with shortness of breathing, a catch in the respiration, particularly after quick motion. Upon examination, in these cases, tumidity of the viscus may be often ascertained from its protrusion beneath the ribs and scrobiculus cordis. The easiest position is usually upon the back, or sitting gently bent forward. All these symptoms are generally increased upon taking matters into the stomach; and the pulse is now much accelerated, especially towards evening. Difficulty of lying upon the right side is not frequently present, and pain in turning to the left side is not often felt, unless the change of position be made suddenly. The tongue at this stage of the disease is generally coated, and of a yellowish or brown colour; it is frequently also dry, particularly at its middle. The pain sometimes complained of at the top of the right shoulder, and so improperly stated as being one of the chief signs of hepatitis, is, when present, certainly characteristic of the disease in the right lobe; but, unfortunately, this symptom is only occasionally present; and the inexperienced practitioner, who has been taught to look to this as a distinctive mark of the disease, infers, when

it is not observed, that the liver is sound. With respect to the pain actually accompanying inflammations of this organ, we may state that it is often felt in the region of the liver, in the lower part of the thorax, and in the epigastric region: it is sometimes referable to the top of the right shoulder, frequently to the right shoulder-blade, and occasionally to both scapulæ: it is, on some occasions, seated in the back, between the lower angles of the scapulæ, and, in some instances, the only pain which has been complained of has been in the loins. We have observed it, in a few cases, in the right clavicle and its vicinity; and in others, in the left shoulder and shoulder-blade only. In many cases, pain is increased in the situation of the disease, or in its vicinity, upon quick motion, upon making a false step, or upon turning suddenly from one side to the other; and, in a few obscure cases, pain is complained of only on such occasions. When the internal structure of the organ is affected, the pain in the hypochondriac and epigastric regions is seldom acute; there is most frequently a sense of aching or dragging, with oppression at the præcordia. Pain is seldom acute, tensive, or pungent, unless the surfaces or ligaments become affected. There is usually great anxiety at the epigastrium and præcordia, accompanied with frequent sighing, particularly when pressure is made simultaneous on the right hypochondrium and under the right shoulder-blade. We have seen a few cases where pain followed the course of the muscles of the right side of the neck: it often extends from under the ensiform cartilage, in the direction of the mediastinum, to between the shoulder-blades; and when this is observed, oppression, dyspnœa, or a sudden catch in breathing, and a dry cough, generally accompany it. Pain frequently, also, extends from the right side, under the shoulder-blade, to the spine, where it terminates. On many occasions, when great congestion of the vessels of the liver seems to accompany inflammation of its substance—states of the organ which, as we have already said, are frequently co-existent—the right lobe becomes very much enlarged, and rises up into the right cavity of the thorax, occasioning great oppression at the chest, fulness at the epigastric region, dyspnœa, frequent dry cough, and sometimes acute pain, owing to the great distension of the covering of the liver at this part, with an increased discharge of mucus from the bronchi. In such cases, the exacerbation of

pain in the chest, upon a full respiration or on coughing, the flushed or tumid state of the countenance, occasioned by the interrupted circulation through the lungs and the seat of the complaint, are apt to make the inexperienced practitioner mistake the disease for pneumonia. In cases of this description there is generally more or less pain or uneasiness felt about the shoulder-blades, or top of the right shoulder, or between the scapulæ; and often numbness of the right arm, with pain about the insertion of the deltoid muscle, or at the wrist, is complained of; rarely, a slight numbness or pain is also felt down the right hip.

Nausea and vomiting are often concomitants of the more acute attacks of inflammation of the substance of the liver; but when they are present in an urgent or continued manner, we should suspect that that part of the liver which is nearest to the stomach is affected, and that considerable disorder extends from the liver to the stomach, or proceeds, in the course of the hepatic ducts, to the gall-bladder and duodenum. This is more likely to be the case when the inflammation arises from the irritation of morbid bile accumulated in the hepatic ducts and gall-bladder. In such cases the patient complains of a sense of fluttering, weight, and fulness, at the right hypochondriac and epigastric regions,—sometimes of pain in the abdomen,—and he reclines chiefly on the left side: the stools are generally watery, frequent, scanty, and very dark coloured, with tenesmus and many of the symptoms of dysentery, for which disease it is often mistaken. Even when but little sickness at stomach is present, there is always loss of appetite in the more acute forms of the disease, heartburn or gripes about an hour or two after a meal, and considerable thirst, with low spirits; and the patient often reclines upon the back or left side, in preference to any other position.

As the inflammation of the internal structure of the liver advances to an acme, the febrile symptoms, particularly towards evening, become more marked. The pulse is more frequent, and its beat irritable; but it often varies greatly, both in frequency, regularity, and development; so that, viewed singly, but little dependence can be placed upon it. The state of the tongue is somewhat more to be relied on: it is generally, in recent cases,

covered with a white, or with a yellow or yellowish-brown fur, approaching to a brown or brownish-black in the worst cases. Early in the disease it is moist, but it becomes dry in the middle, and afterwards at both middle and sides, in the advanced stage of the most acute cases. When the disease is checked at its commencement by appropriate treatment, it continues moist and excited throughout. In cases of the disease supervening to previous disorder of the alimentary canal, or after repeated attacks of hepatic disorder, the tongue seems often smooth and glossy, marked by fissures, and lobulated; and these are often amongst the worst cases, and are most frequently met with in those which are about terminating, or have already terminated, in abscess. In many instances, particularly when the inflammation has supervened to congestion and accumulation of bile on the biliary apparatus, and to a foul state of the mucous surfaces, the coating of the tongue is thick, and the papillæ of the organ very large and distinct. In other cases, where the disease is consequent upon a free discharge of bile, and a well-evacuated state of the stomach and bowels, the tongue continues either moist, with large and excited papillæ; or it is dry and excited: the latter is generally remarked in the most acute cases, supervening to full evacuations of the alimentary viscera. During this advanced period of the disease, there is generally a catch upon taking a full inspiration, and pain upon a forced expiration, even although little or no uneasiness may have been complained of; and the seat or direction of the pain thus induced, may guide the practitioner in his inferences respecting the particular part of the biliary apparatus most affected. The bowels also are generally much disordered, — the motions are morbid, and the stools scanty, slimy, or watery, of a dirty brown colour. There are great dryness of the fauces, urgent thirst, general uneasiness, and frequently aching pains or soreness of the back and limbs, with restless nights.

The state of the countenance and skin deserves attention during the progress of disorder. At its invasion, particularly when attended with chills or rigors, the countenance is pale or sallow, and the skin shrunk and pale on the extremities, but often natural in the trunk. As the inflammatory action becomes developed, the countenance fills out more fully; and when there is great fulness and oppression in the region of the liver and chest,

the face often becomes fuller than natural, with some degree of dusky redness in the cheeks. The countenance and eyes, however, still possess a murky, or muddy, or sallow hue,* and more or less of a dark circle surrounds the eye, particularly beneath it. The tunica albugenia is either of a yellow tint, or of a dull white or pearly hue. The patient often complains of pain in the forehead and over the eyes. The skin on the trunk, especially towards evening, is generally warmer than natural, and is sometimes attended with a greasy feel, and a scanty or partial perspiration. When perspiration is copious, it is frequently very offensive. A certain degree of jaundice is often remarked in the hepatitis of Europe, especially when it terminates in abscess; but jaundice is not a frequent concomitant of hepatitis in India, unless when the ducts or gall-bladder become involved in the disease, or when it supervenes to biliary calculi and obstruction of the ducts. The countenance and eye are, however, always deficient of clearness, and possess a sickly expression.

Great importance should always be attached to the state of the secretions and excretions in all forms of hepatitis, particularly when we have reason to suppose that the internal structure of the viscus is the seat of disease. In those cases originating without any previous derangement of function, the bowels are generally costive early in the disease, and the stools often evince no very serious or marked disorder of the biliary secretion until the disease has made considerable progress. The urine is, however, high coloured, in small quantity, and loaded from the commencement, and the patient often complains of scalding in passing it. If the stools betray either a deficient secretion of bile, or a morbid state of this fluid, the urine is nearly always of a deep colour, and often deposits a dark or brown flaky sediment. When inflammation of the substance of the liver arises out of a congested state of the organ, with accumulations of acrid or morbid bile in the hepatic ducts and

* This appearance of the skin and countenance, so often seen in the advanced stages of the visceral diseases of warm climates, we have imputed more to the absorption of the dark, morbid secretion which so frequently lines the alimentary canal in these disorders, than to the presence of bile in the circulation.

gall-bladder—a sequence of disease for the frequent existence of which we have already contended—the stools are disordered from the commencement; they are generally irregular, foul, dark coloured, and foetid. Sometimes they are of a dark-green colour, and watery; at other times feculent and brown; but generally frequent and offensive. This state of the bowels is often attended with tenesmus, owing to the irritation of the morbid biliary secretion on the mucous coat of the colon and rectum; and hence dysenteric symptoms may supervene to this stage of the disease, and may mask the hepatic disorder from the detection of the practitioner. Thus generally originate those more obstinate forms of dysentery which require depletions, purgatives, and a mercurial course for their removal.

A deficiency of bile in the stools is generally observed in the hepatitis of temperate climates; but this is not always remarked to any considerable extent in warm climates, particularly in India: this fluid is, however, always of a more or less morbid appearance, and is evidently secreted of a diseased and acrid description, independently of the changes induced in it during its passage along the alimentary canal, and from the admixture of the intestinal secretions. This diseased state of the bile has been observed in almost every case wherein the appearance of the motions was duly attended to; so that, as respects healthy bile, it is seldom present, as long as the disease continues unsubdued; and it is more frequently observed very deficient in quantity than too abundant. This latter, however, we have sometimes remarked. The propriety of daily inspecting the excretions of the patient labouring under biliary disease cannot be sufficiently impressed upon the practitioner; for, unless he does this part of his duty regularly and attentively, taking into account, when reflecting upon the appearances which he observes, the modifying effects of remedies, and balancing the whole with concurrent symptoms, he cannot arrive at any degree of certainty respecting their nature. It will be seen, from the foregoing enumeration of phenomena presented by inflammation of the substance of the liver, that there is no one uniformly present, or by itself sufficiently characteristic of the disease. Yet, when viewed in the aggregate, and their mode of supervention duly considered, they may be relied upon with much confidence,

particularly when considered by the experienced practitioner in connexion with numerous other appearances in the state of the patient, and with various shades and combinations of disorder, which scarcely admit of description, and which change their characters in almost every case, according to the internal relations of morbid functions, and the external influences to which they are subject.

When inflammatory action supervenes in the substance of the liver, either primarily or to previous disorder of function, it is very indeterminate in its progress: it may possess almost every degree of activity, and, consequently, may vary in duration from three or four days to as many months, according to the activity of the exciting causes, the predisposition of the organ, the habit and temperament of the patient, and the treatment employed; and as these circumstances may combine, so will the inflammatory action be disposed to terminate in resolution, in abscess, or in some other organic change. Before, however, we turn attention more particularly to these modes of termination, we shall remark first upon the symptoms denoting inflammation of the surfaces of the organ; and next, upon those which seem to evince the existence of inflammatory action in particular parts of the viscus.

When the surface of the liver becomes the seat of inflammation, either primarily, or from the extension of the morbid action from an adjoining part of its substance or some other viscus, the symptoms assume a more acute and definite character. Febrile signs are more prominent, and often supervene to slight rigors and chills; the pulse is generally much accelerated, and hard; the pain in the right hypochondrium is more or less acute; and when the upper surface of the right lobe is affected, or when great tumefaction of this part is present, so that it rises up into the chest, considerable pain and tension are also felt in the right thorax and under the ensiform cartilage and sternum, so as to resemble an attack of pleuritis. There is also cough, much increase of pain, or a catch, upon a full respiration, or upon pressure, especially when made at the time of a full inspiration. When the whole of the upper surface of the organ is the seat of inflammatory action, the attack may be mistaken for pneumonia. The oppression, difficulty of

breathing, pain in the course of the diaphragm and under the sternum, being generally considerable. But we shall have occasion to shew, in the sequel, how it may readily be distinguished from pulmonic disease, with which, however, hepatitis is not infrequently complicated in some countries, particularly in temperate climates.

Inflammation attacking the surfaces of the liver is also attended with greater heat of skin, and with a more unnatural dryness of it, than when the disease is seated in the internal structure. The tongue is generally drier, and more coated; thirst greater; and general uneasiness and distress more marked. The whole of the symptoms assume a more acute form, and are such as alarm the patient and the inexperienced practitioner sooner. But the increased heat and dryness of the skin and tongue, and the marked character of the constitutional symptoms, should be viewed more as the result of the symptomatic fever accompanying inflammatory action, than as symptoms belonging to hepatitis: they are the usual phenomena resulting from inflammation of an acute form, seated chiefly in serous membranes.

With respect to the excretions from the bowels, they are very variable in this form of hepatitis: they are often diminished in quantity and frequency, unless when aperient or purgative medicines are taken, and occasionally they are looser than usual. They often betray a deficiency of bile; but in warm climates this is a comparatively rare occurrence in inflammation of the surfaces of the viscus, unless when the disease has supervened to torpor, congestion of the liver, or accumulations of bile in the hepatic ducts and gall-bladder, when the biliary secretion is rather obstructed in its passage into the alimentary canal, than actually deficient. In such cases, however, the stools assume a bilious character, after the employment of a few doses of some purgative medicine. More frequently, however, the stools evince the secretion of unhealthy bile. That this fluid should be both increased in quantity, and in some respects changed in quality, may be expected from the anatomical and physiological relations of the seat of disease. When the surface of the liver, either wholly or in part, is the seat of inflammatory action, this action is very seldom, in warm climates, limited to the surface

itself, but is generally extended, in a greater or less degree, to the structure immediately beneath. The increased vascular action also existing in the surface is usually attended with excitement of the organ generally, and with augmented determination of the arterial circulation throughout its substance. Hence increased secretion of bile, with some change from its usually healthy character, is more generally the consequence than its contrary,—a diminished flow of this fluid, which is oftener observed in the disease of the parenchymatous structure of the organ. When the bile is secreted in excess, and of a morbid quality, it often excites or irritates the mucous surface of the alimentary canal, to the extent of occasioning a morbid increase of the alvine evacuations; and this effect may go on—as we have already stated with reference to inflammation limited more particularly to the substance of the liver—to the production of diarrhœa, tenesmus, or even dysentery, in addition to the hepatic disease,—a complication, or rather a sequence, of morbid actions, which will be considered by us in the sequel. When inflammation attacks the surface of the liver, the urine is generally high-coloured; but as long as bile is freely secreted and excreted, the urine seldom betrays the existence of bile in it. When, however, the bile is retained on the ducts and in the gall-bladder, or when it is imperfectly secreted, the urine is often muddy, and deposits dark brown flakes.

We have already said, that when the superior surface of the liver is the seat of inflammation, that the symptoms are often more referrible to the chest than to the region of the liver; and this is more remarkably the case when the morbid action of this surface is complicated with general congestion and tumefaction of the organ, as it frequently is. In such cases, coagulable lymph is sometimes thrown out upon the convex surface of the liver, and inflammatory action is thereby induced in the peritoneum, covering the abdominal aspect of the diaphragm; and hence, in the more advanced progress of hepatitis affecting the convex surface, symptoms of diaphragmitis frequently supervene, complicated with those of the liver, and with considerable symptomatic disease of the lungs. In cases of this description, the febrile symptoms and distress of the patient are very prominent. He breathes chiefly by means of the intercostal muscles, and experiences

great anxiety about the epigastrium and præcordia, with a sense of tension or stricture across the chest, and an inability to sit or lie otherwise than in a bent-forward position, or sometimes upon the right side. The cough is frequent, hard, and suppressed, with great increase of the pain, and an inability to draw the breath fully back. The cough is often attended with expectoration of mucus, and is followed by much headach. The countenance is full, anxious, and dusky; and the eyes prominent, heavy, and sallow. There are also shortness of breath, inability of motion, and often considerable fulness beneath the false ribs and at the epigastrium.

When the outer surface of the right lobe is more remarkably inflamed, the painful symptoms are then clearly referrible to the right hypochondrium and margin of the false ribs. The patient generally lies upon the right side and back; the pain is often increased by turning quickly to the left, and by external pressure, and often a fulness may be perceived under the margin of the ribs. Pain then also extends around to the right scapula, and sometimes to the right shoulder. The other symptoms are nearly the same as those already stated. In some cases the temperature of the surface of the right hypochondrium and epigastrium is higher than in any other part of the body.

When the inflammation commences in the concave surface of the liver and the posterior margin, or extends to these situations from some part of the internal structure of the viscus, then the functions of the stomach are very prominently deranged. Nausea and vomiting are often present, particularly a few minutes after substances are taken into the stomach. The thirst, anxiety, and pain at the epigastric region, are urgent, and there is usually much pain in the back, and sometimes in the right shoulder and muscles of the right side of the neck. The pulse is variable, but generally irritable, quick, small, contracted, or hard. There is often felt a sense of fluttering at the scrobiculus cordis, with a heavy dragging pain in the same situation; anxiety and frequent sighing; and sometimes, in the advanced state of the disease, hiccup is present, especially after cold fluids are taken into the stomach. The patient generally reclines upon the left

side, or leans gently forwards. All these symptoms become more urgent if the inflammatory action have extended to the gall-bladder, to the ducts, or to the stomach itself. When such is the case, there is generally a sense of burning felt at the epigastrium, with fulness, frequent and painful eructations of flatus, very quick pulse, with cold, clammy hands, and increased heat of the trunk. The vomiting is frequent and painful, the urine in small quantity, and the stools watery, scanty, and often morbid and offensive. When the ducts and gall-bladder are affected, the pain is felt darting to the right side and back, and from under the ensiform cartilage, in the course of the mediastinum, to the spine: sometimes it extends from the epigastrium to the umbilicus, and back to the right hypochondrium. Singultus and acrid eructations not infrequently also supervene as the disease advances, particularly after substances are taken into the stomach. The patient can seldom bear pressure on the right side and epigastric region, and feels increased uneasiness upon a full inspiration. Increase of uneasiness merely cannot, however, be considered as a distinctive sign of the seat of the inflammation, as this function is more or less affected, particularly on attempts to fill the lungs, in all the stages and forms of the disease: the degree, however, to which the breathing is affected, and the seat of pain or uneasiness, upon taking a full inspiration, is often a guide to the actual state of disorder. A similar remark may be applied to the pain and uneasiness frequently felt upon making a forced expiration; for this means of ascertaining the seat of pain ought always to be practised, whenever the exact nature of the case is in any way doubtful. There are also observed great restlessness and want of sleep, a foul state of the tongue, with large, foul, and brown papillæ. If the tongue become clean from the treatment, the papillæ generally remain long excited or prominent.

When the left lobe of the liver is alone inflamed—a circumstance of rather rare occurrence—the more acute symptoms are observed upon the left side. The left lobe is most frequently inflamed, in conjunction with the right lobe; and when this is the case, the more prominent symptoms are met with on the right side, but the left side is also complained of. Most frequently, however, in this latter case, the symptoms are referred more to the epigastric region. When the left lobe is inflamed, the stomach is very liable to dis-

tensions from flatus; and this distension taking place more especially in the direction of the left side, the liver is often thrown more to the right, as may be seen in some of the plates displaying the appearances of position of the viscera immediately upon exposing the abdominal cavity soon after death.

Before we conclude those observations which more immediately apply to inflammation of the surfaces of the liver, we should observe that, although inflammation of the substance of the organ more frequently supervenes to functional disorders of this viscus, yet the continuance or great extent of these disorders will sometimes give rise to acute inflammation of its surfaces. Thus, the great distension of the liver resulting from congestion of blood in the portal and hepatic veins may, by the injury sustained by the serous covering, from its unusual stretching, induce inflammatory action of some part of its surface.

It should also be remarked, that, although in temperate climates inflammation affecting chiefly the surface of the organ generally assumes the most acute form, and arrives the soonest at some one of its usual terminations, inflammatory action of the substance of the organ being there more prone to put on a chronic or protracted character, yet such is not uniformly the case in warm climates. In these latter, more especially, inflammation of the internal structure frequently assumes, as we have already contended, as active a form, and as quick a course, although by no means so prominent a character, as that of the surfaces of the liver. The reverse, however, is also frequently seen. But it is important to the inexperienced practitioner always to recollect, that inflammation of the substance of the organ will often proceed as rapidly to an unfavourable termination, and that termination be of as dangerous a kind, as the disease of its surfaces,* and that the one requires as decided a

* We have been so desirous to impress the inexperienced practitioner with this opinion, that we have repeated it at this place. A different doctrine is supported by various writers; but some of them have seemed to support it more from the misapplication of the word *chronic* than from any actual difference of opinion with our own. Thus Dr. Girdlestone, in his important pamphlet on the Hepatitis of India, applies the term *chronic* to those inflammations of the liver which are not characterised by very acute symptoms, although they may terminate rapidly in an unfavourable manner. He even divides hepatitis into three stages, of which the chronic stage is the first, the inflammatory the second,

plan of treatment, and even more so, than the other, notwithstanding its more obscure progress.

Although inflammation of the substance of the liver alone often supervenes in warm climates, particularly in India, yet it is comparatively seldom that inflammatory action of the surfaces is limited to them alone: it most frequently extends to the subjacent parenchymatous structure, or to adjoining portions of the peritoneum, or to both. When such is the case, those symptoms which mark the presence of inflammation of the surfaces, according to the part of the surface affected, will be conjoined with some of the signs characterising disease of the substance of the liver. In these cases generally will be remarked considerable acuteness of symptoms, with increase of fever in the evening; urgent thirst; evident disorder of the alvine evacuations, with a morbid condition of the biliary discharge; offensive state of the stools; tumefaction of the right hypochondrium and epigastrium, with flatulency of the stomach and occasional sickness. The tongue is loaded, foul, and excited; the pulse frequent, irritable, sometimes small, and irregular in frequency, fulness, and strength. There is also great restlessness, especially in the evening and night, with want of, or disturbed, sleep. The skin is hot and dry on the trunk of the body, or hot and greasy to the feel. There

and the suppurative the third; thus applying to the first stage of the disease a term by no means appropriate, which is not always present, and which, if it mean any thing, can only imply the states of functional disorder of the liver, already treated of. As to his third stage, it is only an occasional consequence of the disease, and not, properly speaking, a part of it, although inflammation may exist in parts of the liver contiguous to the suppurated portions. Thus there remains only his second stage as applicable to the disease in its regular and idiopathic form. Indeed, inflammations of the liver, whether of its substance, its surfaces, or both, cannot be divided with justice into distinct stages, inasmuch as their progress is indefinite, and as they present no phenomena in one period which may not be observed in another, until abscess or any other mode of termination supervene. Active inflammations, however, not infrequently follow upon chronic inflammatory action, after the operation of the usual causes: but this is only an occasional occurrence; and even when it occurs, the pre-existing chronic disorder cannot be considered as a stage of the consequent disease, in strict pathological reasoning, although it may be viewed as such, whenever the purposes of treatment may require it.

is more or less anxiety and oppression in the epigastrium and at the præcordia, with sallowness of the countenance, and heaviness of the eyes. The pain at the right hypochondrium, in the right thorax, or at the epigastrium, is often considerable, and is increased by a full respiration, by cough, or by pressure. When the right lobe and posterior edge of the liver are the seats of the inflammation, the pain extends under the inferior margin of the right scapula to the back, and sometimes to the shoulder, down the arm, and to the clavicle. There is at first an increase of pain upon lying down on the right side, which is diminished after a time; and there is also much increase of the pain upon turning quickly to the left side.

The terminations and consequences of inflammation of the surfaces of the liver, are resolution, adhesions to adjoining surfaces and viscera, and the extension of the morbid action to the substance of the liver, to the gall-bladder and ducts, and to the peritoneal surface of the stomach, duodenum, colon, or right kidney. When the inflammation affects the substance of the organ, as well as the surface, the termination in abscess frequently occurs, if the disease is not actively treated at the commencement; and even when it is treated judiciously, a certain degree of vascular disorder and tumefaction of some part of the viscus may still remain, particularly in scrofulous habits, which may go on to the production of small abscesses, or to the formation of tubercles, and other chronic organic changes of the organ.

When the convex surface of the liver is inflamed, either primarily or secondarily, coagulable lymph is often soon poured out from the inflamed surface; adhesions to the diaphragm are thus formed, and the inflammatory action often extends to the thoracic aspect of the diaphragm, and to the opposite part of the lungs; and thus abscesses, which point in this direction, not infrequently break either in the bronchial ramifications of the lungs, or into the cavity of the chest when adhesions between the diaphragm and the lungs are not formed, or are incomplete.

When the inflammatory action is thus extended from the convex part of the liver to the diaphragm and lungs, the pectoral symptoms become

more marked; the pain and oppression at the bottom of the chest are more distressing.* The cough is painful, often in paroxysms; is at first dry, and afterwards attended with an expectoration of watery mucus; sometimes singultus is observed; and the patient generally stoops forward, or lies on the left side, with the trunk bent. There are great restlessness, anxiety, and want of sleep, with increased anxiety of countenance, well-marked hectic symptoms, loss of flesh, and a quick, irritable pulse. Respiration is short, difficult, and performed chiefly by the intercostal muscles. As the disease advances to the diaphragm and lungs, the hepatic disorder sometimes becomes diminished, particularly in temperate climates, and at last declines altogether, soon after the inflammatory action of the lungs is fully established; but this is seldom observed in India. When abscess of the liver thus finds its way into the lungs or thorax, and is evacuated in these situations, the event may readily be recognised: but this topic falls under consideration in the next section.

When inflammation extends from the concave and posterior part of the liver to the gall-ducts, gall-bladder, or stomach and duodenum, the symptoms are seldom so well defined as to admit of our drawing any precise inference as to the part or parts actually affected. Although the inflammatory action may advance to one of these parts only, yet all of them, when the disease affects the concave surface of the organ, are deranged in function in a greater or less degree; and hence the symptoms will be referrible to all, rather than to any one viewed singly. Indeed, this is a necessary consequence of the vascular and nervous communications existing between these viscera. Whether the inflammatory action is extended to the stomach, duodenum, gall-bladder, and ducts, simultaneously or consecutively, or to one of them only, we always observe sickness at stomach, tenderness of the epigastric region, and anxiety; frequent vomiting, occasioning great pain during and after the operation; sometimes a burning sensation about the epigastric region, with

* There is occasionally some degree of tightness; but when this symptom is complained of, we have generally inferred the existence of distension of the gall-bladder and hepatic ducts from biliary accumulations, the common or cystic duct, or both, resisting the flow of bile into the duodenum.

much fulness* and flatulence. Great pain, increased on pressure, is also often felt in or near the angle formed by the spine and right scapula. The skin is hot on the trunk, particularly in the region of the liver, and often covered with a cold, clammy perspiration on the extremities: there is sometimes slight jaundice and an anxious aspect of countenance. The tongue is generally much loaded, particularly at the root; and the bowels are constipated, or the stools scanty, dark coloured, watery, and offensive. If the ducts become involved in the inflammatory action, the vascular turgescence sometimes seems to be so great as to diminish, or altogether shut up, the calibre of the ducts, either at the termination of the common duct, or in the course of the hepatic or cystic ducts. When this takes place, jaundice generally supervenes,† with sickness, vomitings, oppression, fulness, and increase of pain in the right thorax and hypochondrium and in the epigastric regions; the pain generally also extends in the course of the seventh rib, under the right shoulder-blade, to the spine.

We have never met with any instance of diseased appearances of the gall-bladder and biliary ducts, upon dissection, uncomplicated with disease, either of the liver, pancreas, or of some part of the alimentary canal. And, although we believe that inflammation may supervene in these situations primarily, yet we consider that they most frequently become deranged consecutively—from the extension of inflammation from the liver on the one hand, or from the duodenum on the other. The symptoms denoting the commencement of inflammation in the ducts, whether occurring primarily or secondarily, cannot always be relied upon, although the experienced practitioner may be often

* When the inflammation is seated in the concave part of the liver, there is seldom so much fulness or distension felt in the right hypochondrium, as there always is when the convexity of the right lobe is the seat of disease; and the liver cannot so often be felt projecting from under the ribs in the former case, as it is in the latter. The distension in the former case, now under consideration, takes place in the direction of the stomach, which, when empty, gives way to it. There is always much disorder of the functions of this viscus, with sense of oppression, &c., especially after matters are received into it; and if abscess forms near the concave surface of the liver, there are often singultus, rejection of the contents of the stomach without effort, difficulty of deglutition, &c.

† In some instances we have seen the skin turn quite dark—not exactly black, but nearly approaching to it. - See *Murby's Case, and Plate XXI.*

led by the previous history of the case, and by the mode in which the symptoms supervene, to infer with much accuracy the existing state of disorder.

Having described the symptoms marking the usual progress of inflammations of the liver, we next notice the appearances observed on dissection of those who have died from this disease, or from some other disease, with structural disorder of this organ. Dissections of individuals dead from fevers or dysentery, frequently present us with inflammatory appearances of the liver in every stage of their progress, without having reached that pitch which seemed incompatible with the duration of life, death having been produced by some other organic lesion; whilst those who have died from disease of this viscus having advanced to its utmost limits, and produced its usual consequences, shew us what these derangements actually are. It is very seldom indeed, that the pathologist has an opportunity of observing inflammations of the liver in their earlier stages, unless in those cases of fever or dysentery, in which hepatic disease had supervened during their advanced stages, and which had terminated fatally in consequence of organic lesion induced in some other viscus. In these cases, however, he will not infrequently observe the usual appearances indicating inflammatory action of some part of the surface, or of the internal structure of the liver, and occasionally he will remark them, either throughout the whole of these situations, or confined to a single lobe. The surface of the organ in the inflamed part is generally more vascular than usual, of a bright red or reddish-brown colour. Sometimes it is covered with a gelatinous coating of lymph; at other times by one much more consistent, which glues the inflamed surface to the contiguous parts. When this coating is removed, the surface of the organ underneath is of a deeper colour, more vascular than natural, and a little thickened. The substance of the liver immediately subjacent is also more vascular, and gives out more blood, when cut into, than in the healthy state. The internal structure of the organ, during the early stages of its inflammatory state, is always more vascular, of a redder or brownish-red colour, and considerably more friable and softer than usual. Occasionally, however, it is firmer and denser; but this is chiefly observed in

the more chronic cases of disease, which will be treated of hereafter. In some instances, the surface of the inflamed organ is variously shaded. Sometimes, it is marked with red, brown, brick-coloured, greenish-brown, and even with almost black spots and streaks, while the internal structure is inflamed, congested with blood, much tumefied, and softer than natural. Upon making a section of the viscus with a very sharp scalpel, and after wiping with a sponge the cut surfaces, they present a lighter-coloured reticulum, or mesh, studded with red or brick-red granulæ, and the divided ends of blood-vessels and biliary ducts. Upon being torn asunder—which is generally done with more facility in the acutely inflamed state, although sometimes with more difficulty in the chronic conditions of disease—the torn surfaces exude a greater quantity of fluid blood, but still retain their minutely granulated structure, and present both a brighter and a deeper colour than in their healthy state. When abscess forms in the substance of the organ, then the appearances become very materially and very variously altered: but we must defer a description of them until hereafter.

Gangrene has been remarked by many writers and teachers as one of the terminations of acute inflammation of the liver: but although we have observed this disease, and made *post mortem* examinations of it, the number of which certainly has not been exceeded by any other intertropical practitioner, we have never seen a single case of gangrene of this viscus. We are inclined to believe that the appearances which have been taken for gangrene have been merely that black, congested, and softened state of the organ which is sometimes observed in the more acute attacks of the disease supervening to congestion, or, at least, this state of the viscus having speedily run into gangrene after the death of the patient; and therefore, if gangrene had actually existed at the time of dissection, it is to be considered as a consequence of death, rather than as a termination of the disease.

Inflammations of the liver, commencing in, or extending to the surfaces, generally give rise to the adhesions of adjoining parts, as already noticed, and to the extension of morbid action to them. Hence it is, whether the inflammation has terminated in abscess or not, that adhesions to the diaphragm,

and extension of the disease to the pleura and lungs, have supervened,—that the biliary ducts, gall-bladder, stomach, and duodenum, have presented appearances of inflammation, of which the concave surface of the liver seemed to be the centre or original seat, these parts being glued to it by means of coagulable lymph,—that the right kidney and right flexure, and the transverse arch of the colon, have been seen adhering to the edge of the liver, and the omentum been found collected beneath the colon, inflammatory action having thus extended itself to various parts of the peritoneal coverings. Sometimes, in addition to these marks of acute inflammatory action in the liver, and proceeding thence to adjoining parts, the liver has been found tumid, congested, and its ducts loaded with dark, inspissated bile. This state has been often remarked by us, without any obstruction of the common or hepatic ducts; and frequently, also, it has been connected with very considerable narrowing and almost with perfect occlusion of them,—most frequently of either the cystic or the common duct. More rarely we have remarked the common and hepatic ducts, and often the cystic duct, reduced to a simple chord,* without the smallest semblance of a canal, and the gall-bladder filled with a great quantity of dark green, inspissated bile. The constriction of the ducts is evidently, in some cases, the result of spasm; in others, of organic change, proceeding from previously existing inflammation. In addition to these appearances, to the production of which the morbid functions and circulation of the liver had doubtless been most conducive, we have noticed considerable inflammatory disorder of the pancreas and duodenum, with tumefaction of the former, and of the mucous coat of

* The cystic duct is often found in this state, (see Plate XXI. Fig. 2.); the hepatic duct is sometimes seen similarly changed; but the common duct is rarely found so diseased in warm climates. When, however, both cystic and hepatic ducts are constricted by spasm, or obstructed by inflammation or any other cause, it may be reasonably supposed that some degree of similar morbid action extends itself to the common duct, or when the common is thus diseased, the cystic and hepatic ducts partake, in some degree, of the derangement. From the evidence, however, which is furnished us by the phenomena of disease, as well as from the appearances observed upon dissection, we conclude that the cystic duct is often contracted, obstructed, or similarly disordered, when the hepatic and even the common ducts are not materially deranged; hence the hepatic bile readily reaches the duodenum, and the stools present appearances of its presence, while the flow of the cystic bile is entirely obstructed; and practitioners who do not

the latter, sometimes completely occluding the opening of the common duct. The other morbid appearances sometimes met with in dissections of hepatic diseases, from their being generally more intimately related with abscess of the liver, and with dysentery, will be noticed hereafter.

There is one subject to which we wish particularly to direct the attention of the practitioner in his endeavours to ascertain the nature and seat of hepatic diseases, — and this is, an attentive manual and ocular examination of the region of the liver. Even in obvious cases, this means of information should not be neglected, as the experienced observer may derive more information from this source than from any other, both as to the extent and progress of the disease. In cases where the inflammation has gone on to abscess, this mode of investigation is quite indispensable. It is very justly remarked by Dr. Ballingall, in his truly valuable work on the diseases of India, that this manner of investigation gives us but little information in the earlier stages of hepatic diseases; but yet, in our opinion, it should not even then be neglected. Information, even of a negative kind, is at all times requisite in the disorders of the liver, and more particularly in those which are most acute. Manual examination should, therefore, be resorted to on every occasion; and the trunk of the body should, in all cases, be exposed to the view of the practitioner, in order to ascertain if fulness or bulging exist in any part of the hypochondrium or in its vicinity. When manual examination is being made, one hand of the practitioner should be pressed at first gently upon the part between the base of the right

advert to this circumstance, but too readily infer that the biliary apparatus is free from disease, because yellow or hepatic bile is seen in the stools. The liver itself may be free from disease, yet the bile may not be of that quality requisite to act upon the chyme, to preserve health, or to remove disorder of the alimentary canal. We often observe pale yellow or straw-coloured motions where we have no reason to infer that the flow of bile directly from the hepatic ducts is impeded; and yet the body wastes, the tone of the bowels is diminished, and looseness or diarrhœa is present. In such cases there is often evidence of obstruction of the cystic duct, or of accumulation of bile in the gall-bladder; and a healthy state of function is seldom brought about until this disorder is removed. We have, therefore, often thought that the due admixture of cystic bile is essential to the healthy performance of the digestive and assimilating functions, and that, although the recent hepatic bile may have its peculiar qualities and influence, the changes which this secretion undergoes in the gall-bladder are requisite to a healthy state of the alimentary canal.

shoulder-blade and the spine, whilst with the other he endeavours to detect, gently, delicately, and with refined tact, tenderness, fulness, or distension, either beneath the right false ribs, at the epigastric region, to the left of this region, or between the right hypochondrium and umbilicus. The state of the intercostal spaces should also be examined on the right side; and if pain be complained of in any of these situations, its nature may be inquired into by careful and varied pressure, whilst counter-pressure is being made on the back, in the place pointed out. The patient ought also to be made to breathe fully at the time when this examination is going forward, and he may be directed to bend, or move his body in various directions. If fulness, tumefaction, or distinct tumour, be felt, the practitioner should endeavour to ascertain their nature by gentle and varied pressure with the points of the fingers; and the existence of tenderness, the degree of tenderness, the depth at which it seems to be seated, and the presence of fluctuation, whether obscure or palpable, ought to be inquired into with as much dexterity as the practitioner can command.

We now come to consider the causes of inflammations of the liver, — and amongst these should be enumerated, in the first place, those which disorder the functions of the stomach, and, at the same time, derange the circulation in the biliary organs. These, we have already seen, are whatever directly or indirectly produces a plethoric state either of the vascular system generally, or of the digestive organs, with debility. Indeed, the chief causes which have been mentioned as productive of the diseases which have been treated of, are also the most powerful predisposing causes to inflammatory action of the liver itself. Where the disposition to inflammation is considerable, from peculiarity of habit, constitution, or temperament, these causes existing, either in a great degree, or continuing to operate for a considerable time, will be sufficient of themselves to produce this state of disease, previous changes having been induced either in the stomach or liver, or both; and those changes will be of the kind already described. Thus hepatitis will supervene as the consequence of previous derangements, rather than as an effect from certain causes operating directly upon the arterial circulation of the liver itself.

The causes, therefore, which predispose the liver to inflammation, and which may be briefly enumerated, are as follow,—full living, particularly upon animal food; the use of highly-seasoned dishes and soups, and of too little vegetable diet; too great indulgence of appetite, and living on a variety of dishes; the continued operation of a high temperature, combined with moisture and malaria; a neglected state of the bowels; indolence and insufficient exercise; the age of puberty; the habitual use of vinous, fermented, or spirituous liquors; exposure to the sun; the sanguine, sanguineo-melancholic, and irritable temperaments, and scrofulous diathesis; a plethoric habit of body; the use of impure water; a dyspeptic state of the stomach; the depressing passions of the mind; the functional disorders of the liver, already described; attacks of fever, particularly of intermittents and remittents; dysentery and diarrhœa; and a state of irritation long kept up in the mucous surface of the alimentary canal, &c. These, while they dispose the organ to inflammatory action, upon the supervention of the direct and efficient causes, are also, more particularly some of them, occasionally the only sources to which hepatitis, in its various degrees of activity, can be traced. More frequently, however, these causes, when acting singly, are insufficient of themselves to produce inflammation, although they may dispose to it; but when two or more of them are combined, their influence is more certain, and after they have continued for some time to act upon the system, the operation of the usual exciting causes is soon followed by its full effect.

Amongst the various influences which more directly occasion the supervention of inflammatory action in the liver, there are few more energetic than the immediate addiction to the use of spirituous liquors;* and the intoxicating drinks which may be obtained by the lower classes of Europeans in every part of India; exposure to cold or wet when the body is over-heated; draughts of cold fluids when the surface is perspiring; fits of anger or passion; great chagrin, disappointment, and severe grief; injuries received in the vicinity of

* This is a cause which, it is almost unnecessary to mention, is entirely limited to soldiers or sailors, in warm climates, and the lower classes of society.

the organ, or sudden and great exertions of strength; blows or injuries on the head; exposure to a hot and intertropical sun, and afterwards to the night dews and malaria; great repletions after long fasting; violent exercise; the retropulsion of cutaneous eruptions; ingurgitation of highly-spiced and rich dishes; the imprudent use of the cold or shower bath; the injudicious exhibition of calomel; and the neglect of the functions of the bowels. These causes, when acting singly, may not always give rise to the disease, unless the organ has been disposed to undergo it, by the continued influence of one or more of the predisposing causes; and we often may trace the operation of two or more of the occasional or exciting causes in the production of the morbid action. Thus the mental emotions already alluded to, may participate with exposure to the sun, to night dews, or to any other of the exciting causes, in the production of the disease to which the organ had been disposed by the combined action of another set of influences. And even the exciting or occasional causes, when present in great force, and acting in conjunction, may occasion the malady, without the existence of any predisposing influence which could have assisted their action, further than the more universally prevalent one of a very high range of temperature, combined with a moist state of atmosphere and terrestrial exhalations.

Amongst the predisposing and exciting causes of hepatic disorders, we have enumerated several which may seem somewhat problematical to some of our readers. The age of puberty was first noticed, we believe, by Dr. Girdlestone, amongst the circumstances predisposing to the hepatitis of India; and so far as that the disease is seldom or never met with amongst Europeans until after that epoch, we agree with him. Amongst the many lads and boys which accompany European regiments as drummers, the disease is seldom or never met with until they arrive at puberty; but this particular period of life is not more liable to it than others much more advanced. Exposure to the vertical rays of the sun seems to favour the supervention of the disease, by producing a similar state of the nervous system to that resulting from injuries and blows on the head; and this cause, as well as such injuries, can only influence the circulation of the liver through the medium of the nervous system, and owing to the sympathy existing between both organs.

Those causes which overturn the balance of the circulation, and repel it from the surface of the body, and those which act more immediately upon the digestive organs, and especially upon the liver, generally operate their effects in too obvious a manner to require explanation. Amongst these, however, we may notice the use of bad water as one, the influence of which may be disputed; but we have had so many reasons to believe that it operated with others in the production of hepatic derangements, as well as of disorders of the digestive apparatus generally, that we have thought it right to assign it a place amongst their causes. As to its mode of operation, we can say nothing further than that the frequent use of an impure fluid weakens the energy of the viscus, destroys the tone of its vessels, and disposes them to suffer from those causes which derange the state of their circulatory function.

The depressing passions of the mind are generally remarked in hepatic inflammations. In such cases they are merely symptoms of the disease. But they are also amongst the most frequent causes of all kinds of biliary disorders, and are not the less to be looked upon as causes, for being also generally present as effects of those diseases. The repulsion of eruptions, and the sudden arrest of bilious flux or of diarrhoea, have also seemed to us as sometimes concerned in the supervention of hepatitis. Chronic ulcers, as long as they remain open, seem to divert disease of an active kind from the liver, although they are frequently dependent upon functional derangements of this viscus; and they should never be dried up, unless a well-directed course of internal treatment has been instituted, for the purpose of removing whatever disorder of the biliary and digestive organs may be existing at the time. The too sudden arrest of biliary flux and diarrhoea is chiefly hurtful in occasioning an accumulation of morbid bile on the hepatic ducts and gall-bladder, that may become a source of irritation to the liver, which is generally at the time in a state sufficiently prone to take on inflammatory action.

The influence of the direct rays of the sun and a high range of temperature, in producing hepatic derangements, particularly inflammations of the liver,

cannot, in our opinion, be disputed: indeed, the practitioner need not proceed to intertropical regions in order to satisfy himself of this fact: the warmer seasons of a temperate climate are sufficient to prove it. The observations which we have already offered upon the effects of high temperature on the human constitution, may serve to explain the mode in which it deranges the functions and circulation of the liver.* A varied observation in different provinces in India has furnished us numerous proofs in illustration of the very extended influence of this cause amongst the natives of temperate climates; and we need only refer to the Abstracts of the Returns (given at p. 110 *et seq.*), and in the Appendix to the present Volume, for proofs of this influence on an extended scale. In the Carnatic, the prevalence of hepatic disease is well known: here the range of temperature is much higher than in any other part of India; the fall of rain is also very much less than in the provinces under the Bengal and Bombay presidencies; and the soil more naked, more gravelly, and less retentive, than in the latter: hence the great heat is not so frequently nor so adequately abated; and the cooling effects of a fall of rain sooner cease. Whilst the provinces under the Madras presidency are near the equator, several of the other districts of the British empire in India are situate beyond the tropic; and thus, from latitude, and the various peculiarities of soil, situation, and climate, the Carnatic and several other provinces in the Indian peninsula possess a much higher range of temperature, and a proportionately greater liability to inflammatory affections of the liver. It is sufficient for us to express the result of our own observation respecting the matter, since the same fact has been very justly stated and illustrated in Dr. James Johnson's valuable work on tropical diseases, which is deservedly in the hands of every practitioner in warm climates.

The following Cases illustrate many of the forms of active inflammations of the liver, more particularly those which are well marked at their commencement and during their progress. When we come to treat of abscess of the liver, and of hepatic dysentery, we shall have occasion to adduce

* See p. 298, *et seq.*

others, evincing the very silent and insidious manner in which inflammation sometimes commences in the substance of the liver, and runs its course to an unfavourable termination.

CASE L. — *Inflammation of the internal Structure of the Liver.*

HUGH KELLY, admitted May 15, 1817. Complained this morning of pain in his belly and purging, and took a dose of the mistura purgans, which operated both ways; he vomited green viscid bile; feels a bitter taste in his mouth; foul, yellow tongue; countenance haggard; pulse small and languid; skin cold.—Calomel. gr. xx. statim.; haust. amar. cum sennâ, ℥ij., horas post quatuor; haust. anodyn. h. s. s.

16th. — Stools small and scanty; no fæces; tongue foul; pulse quick and irritable; no pain in his side; but feels uneasiness about the lower part of his belly, and giddiness in his head. — Mist. purgan. ℥jv.

Evening. — Has been well purged, stools natural; tongue foul and furred; felt a strong pulsation this morning at the scrobiculus cordis, and an aching dull pain in the right side; there is some fulness to be felt, and pain on pressure; no pain in his belly. — Apply thirty leeches. Calomel. gr. xx. h. s.; mist. salin. febrif.

17th. — Leeches bled very well, and a great deal in the night; the pain quite gone; stools copious and natural; tongue cleaner. — Mist. purgan. ℥jv.

Evening. — Stools scanty; feels very weak; pulse quick; tongue clean at the point, but foul at the root. — Pil. calomel. gr. xx. Haust. anodyn.

18th. — Much better; tongue cleaner; stools watery, with some feculent matter; pain gone; pulse good. — Mist. purgan. ℥ij. immediately, and repeat in one hour if he is not purged.

Evening. — Better; stools watery and feculent. — Haust. amar. cum sennâ, ℥ij.

19th. — Tongue cleaner; stools natural; no pain. — Pil. hydr. cum calomel. no. 1. four times a day. Haust. amar. cum sennâ, ℥ij.

Evening. — Still feels uneasiness at his stomach; tongue clean; no stools; feels faint, and a sinking sensation. — Haust. amar. cum sennâ, ℥ij; pil. hydr. cum cal. Blister the scrobiculus cordis.

20th. — Perspired a good deal in the night, and is now in a perspiration; his tongue is foul; pulse quick; stools scanty, but feculent; no fainting sensation. — Renew the blister. Cont. pil. hydr. cum calomel. no. 1. three times a day. Haust. amar. cum sennâ, ℥ij.

Evening. — Tongue clean; no fainting; feels better. — Repet. pil. hydr. cum calomel. et haust. amar. cum sennâ, ℥ij.

21st. — No alteration. — Repet. pilul. hydr. cum calomel. et haust. amar. cum sennâ, ℥ij.

22d. — Feels very weak; no pain. — Cont. pilul.; a wine-glassful of the decoction of bark every three or four hours; two glasses of wine.

Evening. — Much better; stools better; tongue foul; feels weak. — Decoct. cort. ut antea. Cont. pilul. et haust. amar. ut antea.

23d. — Much better; stools of a natural appearance, with some green fæces; tongue clean; no pain. — Cont. bark. Repet. pil. et haust. amar.

24th. — Has no pain at all; stools natural; mouth affected; feels weak. — Omit the pills. Cont. bark.

25th. — Tongue quite clean; stools of a dark green colour, but natural; says he passed some small worms this morning. — Mist. purg. ℥iij. Cont. cortex Per.

26th and 27th. — Much better. — Continue bark, and add ℥ij. tinct. cort. Fowl for diet.

28th. — Stools feculent and tenacious; no pain in his belly. — Mist. purg. ℥iij.

29th. — Has been purged; stools black and feculent. — Continue the medicine.

30th. — Ol. ricini, ℥ij. — *Evening.* Stools feculent, with viscid, tenacious mucus, and a little blood. — Calom. gr. xij.

31st. — Stools better, no blood, but of a dark colour. — Ol. ricini, ℥j.

Evening. — Stools green and feculent; feels better. — No medicine.

June 1st. — Quite well. — Ol. ricini, ℥jss.

2d. — Motions perfectly natural and good. — No medicine.

3d. — Quite well. — 4th. Discharged.

Remarks. — The disorder of the alimentary canal first complained of; the quick, irritable pulse; vertigo; the state of the tongue and countenance, were here sufficient to raise suspicion of inflammatory action of the substance of the liver, which was developed and rendered more evident by the emetic effect of the purging mixture taken on his admission. The pulsation complained of at the scrobiculus cordis on the following day, with fulness and dull pain in his right side and epigastrium, made the origin and nature of the disease quite manifest. The very copious local depletion, and the quantity of blood lost after the removal of the leeches, completely arrested the inflammatory action, and left nothing further than morbid secretion and debility to contend with.

CASE LI.—*Acute Hepatitis, affecting chiefly the internal Structure of the Liver, and producing morbid Biliary Secretion and obstinate Disorder of the Bowels.*

WILLIAM COOPER, aged 24, (has been several years in India,) was admitted on the 3d of January, 1817, with pain in his right side, white tongue, and febrile pulse. Sixteen leeches were applied to his side on admission, and a cathartic draught and an enema administered, which were followed by the saline mixture, containing tartarized antimony. In the evening the pain was diminished, and the stools were copious, brown, and watery. The tongue was cleaner, and the pulse 90, and full: there were also headach and giddiness. Fourteen leeches were applied to the side, and an emetic exhibited. — On the 4th, the pain had left his side, and there was no headach: the pulse was 108, and small; the tongue white; stools watery and brown; and he complained now of pain at the pit of the stomach. Eighteen leeches were applied to this part; a cathartic was ordered, and the saline mixture continued. In the evening the pulse was less frequent; skin natural; stools copious and more feculent, with griping and pain in his bowels. Fourteen leeches were then applied to the belly; the saline mixture continued; and twenty grains of calomel given at bed-time.

On the 5th his tongue was white and dry; had some heavy, dull pain across his side and scrobiculus cordis, with soreness in his bowels; pulse 84, somewhat hard; stools scanty, yellow, and feculent. Fourteen leeches were applied to his side; and the cathartic draught, with \mathfrak{z} ss. of sulph. magnes. was given, and the saline mixture continued. In the evening, the stools were bilious and feculent, and the pain diminished. Twenty grains of calomel were given at bed-time. — On the 6th a slight return of pain in his side was remarked: his tongue was moist, and his pulse 84, and full. Fourteen leeches were applied: five grains of blue-pill, followed by a purgative draught and the saline mixture, were given: a blue-pill was also taken at bed-time.

7th. — Had still pain in his side; was griped in the night; stools feculent, watery, and brown; tongue white; pulse 84, and full. — Sixteen leeches were again applied to his side, and the same medicines continued.

8th. — Stools copious and crude; pain of side diminished; pulse 78; tongue dry in the middle; bowels griped. — Infricetur unguent. mercur. \mathfrak{z} j. region. umbil. mane nocteque; pilul. hydrarg. cum calom. et pulv. antim. no. 1. ter die; haust. amar. cum sennâ, \mathfrak{z} jss. nocte et mane.

9th. — Tongue clean; no pain. — Cont. pilul. et haust.

On the 10th he had a slight return of pain, for which a blister was applied; and as

the former draughts had not operated, the purging mixture was substituted. This procured dark-coloured and feculent stools. The saline mixture was given through the day, the pills continued, and a purging draught taken early in the morning; the stools continued morbid, dark-coloured, and watery; the pulse rose in frequency to 130; and the tongue became white. To these supervened, on the 14th, straining; dryness of tongue; pain throughout the lower part of the abdomen, increased on pressure, and fulness. The motions now became still more morbid, with flakes of mucus, and some feculent matter.—Two drachms of the unguent. mercur. cum camphor. were now rubbed in night and morning, instead of the simple mercurial ointment. The pills were continued, and the diseased secretions carried off by means of the purging powder and aperient enemata. The pain in his belly was diminished by the above remedies; but his tongue still remained white and loaded, and his motions morbid and offensive.

Nearly the same treatment was continued: friction with mercurial ointment and camphor; the pills and purgatives, consisting either of the common purging powder or calomel with antimonial powder, were exhibited daily until the 21st, when his tongue became cleaner, the belly less tumid and painful, and his motions less morbid and offensive.—On the 22d his bowels were open; pulse regular, and not frequent; mouth not affected, and he felt nearly well. The above treatment was continued.

23d.—The pain in his side had returned on the previous night, and a blister had been immediately applied. Pulse now 72, and good; tongue white and dry; skin cool; stools scanty; has still pain in his right side, and fulness in the epigastric region.—Continue the friction three times a day. Pulv. purg. stat. Contin. pilul. cum aloë et calom. ter die. The purging powder procured copious bilious motions.

24th.—Stools scanty, with mucus; had a cold shivering last night, which has continued till now; pulse 82, and regular; tongue white and excited, with tremor when held out; complains of pain and fulness of the abdomen.—Foment his belly. Infus. sennæ cum mannâ, et sulph. magnes. stat. Continue the pills four times a day, and the mercurial friction thrice daily. Pulv. Doveri, ʒj. h. s. s.

25th.—Has been purged; motions watery, with viscid mucus; tongue white and furred; pulse small and frequent; pain of abdomen diminished; has had no return of the cold shiverings; appetite good; does not lose flesh.—Cont. med. Rice-milk for breakfast; half allowance of meat; bread and milk for supper.

26th.—Stools consist chiefly of thick, viscid mucus; pulse 90, somewhat hard; mouth not affected.—Cont. med. Blister still open and discharging.

27th.—Is better; no soreness or fulness in his belly; tongue white and furred; pulse 98, and small.—Cont. med. omnia.

Evening. — Complains of a dull pain shooting from the scrobiculus cordis to the back; evacuations crude, and mixed with mucus. — Calom. gr. xij., cum pulv. antim. gr. viij. h. s. s.

28th. — Tongue foul; still some soreness in the abdomen; passes great quantities of glairy mucus, with small pieces of membranous-like matter; fulness at the stomach diminished; pulse 82. — Haust. amar. cum sennâ, et natron. vitriol. Capiat. pilul. ter die. Cont. frictio. Repet. calom. et pulv. antim. horâ somni.

29th. — Symptoms the same. — Cont. haust. et pilul. et frictio. Pulv. Doveri, ʒj. h. s. s.

30th. — Stools copious, watery, and offensive, with viscid mucus; tongue somewhat cleaner; soreness and fulness of abdomen quite gone. — Cont. pilul. haust. et frictio. Pulv. Doveri, gr. xv. h. s.

31st. — The same symptoms continue. — Pulv. Doveri, h. s. Haust. primo mane.

February 1st. — Stools full of viscid mucus: no pain; tongue still loaded. — Cont. pilul. et haust. et frictio.

2d. — Symptoms the same; mouth not affected. — Cont. pilul. et haust. et frictio.

3d. — Tongue cleaner; stools more feculent; pulse much improved; no pain. — Cont. med.

4th. — Tongue cleaner; stools feculent, with an amazing quantity of viscid mucus. — Cont. haust. pilul. et frictio.

5th. — Stools becoming natural, and his tongue clean. — Cont. haust. pilul. et frictio.

6th. — Pulse, tongue, and state of the motions, have all improved. — Cont. med.

7th. — Stools natural and formed; no pain or uneasiness of any kind; pulse 74, and natural; tongue clean. — Omit. pilul. et frictio. Cont. haust. amar. cum sal. Glauberi, ʒj. ut antea.

From this time he rapidly recovered, and was discharged, quite well, on the 10th.

Remarks. — The inflammation in this case evidently was seated chiefly in the substance of the liver; and although its activity was subdued during the earlier stage of the treatment, yet it evidently was present to some extent until the period when amelioration took place. During the first two days of the treatment, 76 ounces of blood were taken locally, and on the three subsequent days 54 ounces more were abstracted; making, altogether, 130 ounces in five days. The cold shivering which supervened on the 24th; the tremor of the tongue, and its long-continued state of foulness and excitement, together with the dull pain felt at one time shooting through the region of the

liver; the foul and dark state of the motions; the tumid and sore state of the abdomen and epigastric region; and the circumstance of the mouth remaining quite unaffected, notwithstanding the active means employed to bring the system under the mercurial influence,—combined to convince us that the inflammatory action of the liver had run on to abscess. Whether or no such was actually the case, and the treatment was successful in bringing about absorption of whatever matter may have formed, we will not take upon ourselves to decide. Besides these topics, this case presents others not devoid of interest; namely, the long time during which purgatives and deobstruent aperients, combined with tonics, were constantly exhibited; the frequency of their exhibition; the foul, morbid, and viscid state of the stools throughout; and lastly, the immense quantity of glairy mucus passed in the motions. In order to ensure the advantages of the purgative treatment, and support his strength during its employment, it will be observed, that the patient was allowed as liberal a diet as circumstances would permit.

CASE LII.—*Acute Hepatitis, supervening to Congestion and Accumulation of Bile, and affecting chiefly the Substance of the Organ.*

RICHARD KELLY, (had been several years in India,) was admitted the 15th March, 1817, with the symptoms of congestion of the liver and accumulation of bile. These were removed by an emetic and purges. Five days after his discharge he returned, and on the evening of the 22d, the following report of him was given in the Hospital journals:—Attacked with severe aching pains in the loins, shoulder-blades, and right side; anxiety; cold partial sweats; foul and excited tongue; and quick pulse.—Apply twenty leeches to his side. Calomel. gr. xx. h. s. s.

23d.—The pain in his back and side is relieved; but he has still occasional pain under the ribs: he has also some pain in his right shoulder. Tongue white and excited; pulse 80, small, irregular, and irritable. The pain is increased on a full inspiration. Was purged in the night.—Twenty-four leeches to the side; and the mist. purgans, with half an ounce of sulphate of magnesia.—*Evening.* Pain of the side nearly gone, but he complains of soreness over his whole body; pulse 96; tongue dry, furred, and excited; great thirst; stools crude and copious.—Calomel. gr. xx. h. s. Mist. salina febr. A blister to his side.

24th.—Stools crude and full of viscid mucus; pain in his side and shoulder gone; tongue white and furred; pulse 78.—Pulv. purgan. ʒjss. stat. Rub in ʒj. unguent.

mercur. thrice daily. Pilul. hydr. cum calom. no. 1. ter die. Haustus amar. cum sennâ, ℥ij. primo mane.

This treatment was continued during the 25th and 26th. The pulse became less frequent; his tongue cleaner; and his motions more natural. On the 27th, he had a slight return of pain in the night, beneath the fifth rib of the right side; but his tongue and stools were natural at the morning visit; his pulse 66; and his skin cool. — Twelve leeches were applied, and the pilul. hydr. cum cal.; the mercurial friction and haust. amar. cum sennâ were continued. — *Evening.* Can breathe with perfect ease; no complaint. — On the 31st, the mercurial friction was diminished; the pilul. hydr. cum cal. was omitted; and five grains of blue-pill given every night; the saline mixture through the day; and a dose of the purging mixture early in the morning.

On the 2d April, he was perfectly well; his bowels, tongue, skin, and pulse, being perfectly natural. The blue-pill and mercurial friction were left off; and a dose of the purging mixture given occasionally. He was discharged on the 4th.

Remarks. — This case illustrates chiefly the connexion often existing between functional disorder and inflammation of the organ. The symptoms were clearly referrible, in this case, to the liver, and indicated disease affecting principally its internal structure. In this case there was no rigor at its commencement; and the pain of the shoulder was at first not present. General soreness, after the pain had been removed by depletions, was here complained of, and is a frequent symptom of inflammation of the internal structure of this important organ.

CASE LIII. — *Acute Hepatitis affecting the internal Structure of the Organ, with Congestion, morbid and copious Secretion of Bile, and Accumulation of disordered Secretions on the Bowels.*

MOSES QUIN, seaman, ship General Palmer. 11 o'clock, A.M. 10th February, 1820. Admitted this morning, with pain about his chest and all over the abdomen; bowels are in general costive; respiration somewhat oppressed; sickness at stomach, with occasional vomiting; and considerable tumefaction; no bitter taste in his mouth; tongue white and excited; pulse quick and firm. Complaints of four days' standing; took opening medicine every day, but found no relief from it. — R Mistur. purg. ℥ij. ; ol. menth. ℥ij. M. ft. haust. stat. App. hirud. xx. abdom. et sterni parti dolenti.

Vespere. — No stool from his medicine; pain complained of, somewhat relieved by

the leeches. — Hab. enema purg. statim. R Hydr. submur. ʒj., opii puri, gr. ij., pulv. ipecac. gr. iij. M. ft. pil. duæ, h. s. s.

11th. — Stools copious, feculent, and bilious; feels much better in his bowels; pain nearly relieved in his chest; tongue furred and excited; vomited a quantity of bilious matter in the night, but none since; pulse 90, firm, but not full; passed a restless night; great thirst. — Sumat pulv. jalap. compos. ʒj. App. hirud. xv. sterno.

Vespere. — Complains of general soreness and pain across his loins; pulse 90, and full; considerable oppression; skin warm, but moist; has no pain in his head; tongue excited; stools dark and morbid. — Venæsectio ad ʒxxxij. Repet. pilul. ij. ut heri præ. h. s. R Mistur. salin. feb. compos. ʒij. tertiâ quâque horâ.

12th. — The blood drawn has no appearance of buff; the first pound rather cupped; pulse 94, soft; skin natural; tongue clean, and very little excited; feels much relief from the bleeding. No stool. — Repet. pulv. aper. stat. Cont. mist. salin. ut antea.

Vespere. — Complains of pain across the umbilicus; no tension of abdomen; stools dark-green coloured and feculent; tongue excited; pulse frequent, but soft; skin cool; no thirst; appetite bad. — Applicentur hirudines xv. parti dolenti. R Pilul. aloët. cum cal. no. 1. ter die. R Mistur. amar. cum sennâ, ʒiij. nocte manequ. Habeat enema purg. quàm primùm.

13th. — Alvine evacuations copious and of a bright-green colour, feculent and offensive; the pain in his belly considerably relieved by the leeches; he complains this morning of pain in the hepatic region, immediately under the margin of the ribs, but it does not impede his breathing; severe pain also across his loins; pulse quick and irritable; tongue moist, but furred and excited; skin cool and moist; no thirst. — App. hirud. xv. hepatis reg. Cont. med. ut suprâ: post hirudines, applicentur emp. lyttæ ampl. parti dolenti.

Vespere. — Feels pretty easy this evening; blister pains him; stools offensive, feculent, and of a brown colour. — Contin. medicamenta.

14th. — Feels pain this morning only from the blister; tongue rather foul; pulse frequent, but soft; skin natural; stools as yesterday, and tenacious, but have a full secretion of bile; gums sore. — Cont. medicamenta.

15th. — Stools offensive and dark coloured; feels easy, with the exception of the blister; tongue clean; pulse frequent, 104 in the minute; skin rather warm; mouth sore; but no ptyalism. — Repet. pulv. jalap. comp. ʒj. stat. Cont. medicamenta.

Vespere. — Stools copious and very dark coloured, offensive and feculent; feels

quite easy in his bowels; blister very painful; skin hot, and covered with a profuse sweat; complains of pain in his head, immediately over his forehead; pulse frequent and rather full; tongue moist and clean; great thirst; gums sore, but no discharge of saliva. — App. hirud. vj. utrique tempori. R Hydr. submur. ʒj.; opii puri, gr. ij.; cons. rosæ, q. s. Ft. pilulæ duæ, horâ somni sumendæ.

16th. — Four dark-coloured motions and very fœtid; says he feels quite well this morning; head relieved; pulse 110 in a minute, and firm, but not full; mouth sore, but no ptyalism; blister discharges a good deal, and is very painful; no pain in the hepatic region or belly; respiration perfectly free and natural; tongue clean and moist; skin cool; no thirst; he feels an appetite this morning. — Repet. pulv. purg. statim. Contin. alia, ut antea.

Vespere. — Purged freely, and his stools are bilious; says he feels very well. — Cont. med.

17th. — The stools are offensive, but of a better appearance; no pain or uneasiness in his side or belly; tongue clean; pulse good; skin natural; mouth more affected, but no discharge of saliva; no thirst; his appetite is improving. — Cont. medicamenta. Half diet.

18th and 19th. — No complaints, with the exception of a slightly sore mouth. — Omit. pilul. Cont. haust. amar.

20th. — Continues well; bowels open. — Contin. med.

21st and 22d. — Tongue rather furred, but clean; pulse firm and good; skin natural; stools regular. — Cont. med. — 23d. Free from complaints. — Cont. med.

24th and 25th. — Tongue clean; pulse and skin natural; and he feels quite well in every respect. — Cont. med. Full diet.

26th. — No complaints. — Omit. med. — 27th. Convalescent.

28th. — As yesterday. Discharged the hospital.

Remarks. — This case illustrates many of the observations offered on hepatic disorders, and the relation subsisting between them and accumulation of morbid secretions in the alimentary canal. There was great tumidity of the liver in this instance, accompanying the inflammatory attack; and but for the very copious general depletion instituted on the evening of the 11th, and which the state of the pulse, the general soreness complained of, and the excited state of the tongue imperatively demanded, abscess of the viscus would most probably have rapidly supervened. It often happens that the local bleeding, by removing the load oppressing the vascular system, renders reaction more acute, and a repetition of depletion even more necessary than before it was first instituted. Such was the

case in this instance. Amongst other matters of interest, we may remark the copious and morbid discharge of bile; the abundance and diseased state of the stools; the affection of the stomach; the irritable beat of pulse; and the general soreness complained of towards the decline of the disease. The great discharge from the blistered part was particularly remarkable in this case. Was it the cause of preventing the supervention of ptyalism, which did not take place, although the mouth was sore for several days?

CASE LIV.—*Inflammatory Action of the Substance of the Liver, with morbid intestinal Secretions, and Affection of the Kidneys.*

ROBERT CLARK, ætat. 22, admitted 23d March, 1817. *Evening*.—Complains of pain in his stomach and right side; foul tongue.—Apply twenty leeches to his side and belly. Cal. gr. xx. h. s.

24th.—Stools morbid and green water; very little fæces; tongue dry, white, and excited; feels a lump, as he calls it, in his stomach; pulse small and frequent; the pain is relieved by the leeches; no sickness at stomach.—Mist. emetic. stat. Secundâ horâ, P.M., capiat haust. anodyn.

Evening.—The vomit operated both ways, threw up a great deal of bile, and has been very fully purged; says he cannot pass his water; tongue white and dry, as before; complains less of the lump in his stomach; pulse small and frequent.—R Tinct. opii, ℥xl.; aq. ammon. ℥xxx.; spt. æther. nit. ʒij.; aq. puræ, ʒij. M. h. s. s. Foment his belly.

25th.—Was strained all night; stools mucus, with blood, and a very little fæces, of a pale clay colour; tongue white; has still the sensation of a lump in his stomach, which is always worse when his stomach is full; passed his water in the night.—Pulv. purg. in aq. menth. pip. ʒij. Apply a blister to the pit of his stomach. Enema purgans. R Mist. salin. febr. ℥bj.; aq. ammon. ℥lx.; spt. æth. nit. ʒss. M. A wine-glassful every three or four hours.

Evening.—Stools very copious and morbid, with an amazing quantity of viscid mucus; pulse languid; some febrile heat; tongue excited; water white, thick, and in very small quantity; has no pain in his back, except when at stool.—Cal. gr. xx.; opii, gr. ij.; syr. q. s. Ft. pil. h. s. s. Cont. mist. salin. ℥bj. cum aq. amm. ʒj.

26th.—Stools more natural, and no mucus; pulse languid; no fever; tongue foul; water rather turbid, with a copious sediment, and made with more ease;

the pain in his stomach is less; he passed a quantity of urine in the night. — R Infus. amar. ℥j.; infus. sennæ, ℥ss.; tinct. cardam. ℥ss.; mag. vit. ℥ij. To be taken three times a day. Cont. mist. salin. ut antea.

Twelve o'Clock. — Stools are small, blood and mucus. — Pulv. purgans.

Evening. — Stools of a natural appearance; tongue dry; water turbid, with sediment; pulse weak; and he feels a faintish sensation when he moves; has no pain in his side; and can breathe with ease. — Repet. mist. salin. cum spt. æther. nitros. ℥ss. et vin. ant. ℥ss. Cal. gr. x.; pulv. ant. gr. vj.; opii puri, gr. jss.; syr. q. s. Ft. pil. h. s. s.

27th. — Passed a very restless night; stools morbid and feculent, of a clay colour and consistence; he is very weak, and strains when at stool; no blood; pulse weak. — Pulv. purg. stat. Cont. mist. salin. Wine, two glasses in the day. Sago diet.

Evening. — Stools natural, but viscid and tenacious; water turbid. — Rep. pil. ut antea. R Tinct. ferri mur. ℥xv.; aq. puræ, ℥ij. M. Three or four times a day. Cont. mist. salin. ut antea.

28th. — Stools much more natural; no pain at all; made water more frequently, but not much at a time. — Cont. mist. sal. three times a day. Tinct. ferri muriat. ℥xx. ter die, ex aquâ. Pil. hydr. j. nocte maneque.

Evening. — Stools blood, with some fæces. — Cont. mist. salin.; et tinct. ferri, ut antea. Cal. gr. vj. h. s. s. Three glasses of punch.

29th. — Stools copious, more feculent, and in every respect better; is very much better this morning, and makes more water. Cont. mist. salin.; et tinct. ferri muriat. ut antea. Punch. — *Evening.* Is better; makes water more freely; urine clearer. — Cont. ut antea.

30th. — Much better; stools natural, and water free and clear. — Cont. ut antea.

31st. — Stools perfectly natural; water free; tongue clean. — Cont. ut antea.

April 1st. — Stools natural and copious; water free, and of a proper colour; feels pain about the kidneys when he goes to stool. — Apply eight leeches. Cont. med. ut antea.

Evening. — The leeches have relieved him very much, and he is much better; stools and water quite natural. — Cont. ut antea.

2d. — Much better; no pain in his back; stools copious; water free; tongue clean. — Cont. ut antea. Pulv. calumb. comp.* twice a day.

3d. — Much better. — Cont. ut antea. — 4th and 5th. Cont. ut antea.

* This powder consists of ten grains of calumba, six grains of rhubarb, and five grains of ginger.

6th. — Was attacked with fainting this morning, when walking out; is now much better. — Cont. med. ut antea. Pilul. hydrarg. cum calom. et pulv. antim. no. 1. twice a day.

7th. — Was very much purged in the night; stools very copious, of a lead colour, watery consistence, mixed with feculent matter; tongue furred and white. — Omit the powders. — Cont. pilulæ, ut antea. Mist. salin. febrif.

Evening. — Feels the heat of the weather very oppressive; he is no better since morning. — Cont. med. ut antea.

8th. — Stools of a pale colour; makes water; feels weak; had slight pain in the night. — Omit the pills. Repet. pulv. calumb. Mist. salin. ut antea.

9th. — Much better this morning. — Cont. pulv. et mist. salin. ut antea.

10th. — Improving every day, but weak; stools perfectly natural, and of a healthy colour. — Cont. ut antea.

11th. — Improving daily. — 13th. Has no disease. — No medicine.

16th. — Quite well. Discharged.

Remarks. — The lump complained of by the patient in this case is difficult of explanation. It may have been occasioned by the pressure of accumulated bile in the gall-bladder, or by matters lodged in the cells of the colon, and pressing upon the stomach. There was much debility present in this case from its commencement: hence one local bleeding only, as large as could be ventured upon, was put in practice. Stimulants were even required to keep up the vital energies, so as to give the purgatives a chance of success. The advantage experienced from the local depletion on the loins and the muriated tincture of iron was here very remarkable. After the first depletion, the chief sign of remaining disorder of the liver was the extreme restlessness of the patient at night. The very morbid state of the motions, and disordered function of the bowels, evidently depended upon the liver affection.

CASE LV. — *Active Congestion, Discharge of accumulated Bile, followed by Inflammatory Action of the convex Surface of the Liver. — Recovery.*

MICHAEL KELLY, ætat. 18, admitted 26th July, 1816. Complains of pain in his head, chest, and the small of his back: has also pain in the course of the arch of the colon, and a sensation as if something was squeezing it together; tongue white; bowels regular; stools natural. — Apply sixteen leeches to the course of the colon. Mist. purg. ℥ij. ; calom. gr. xx. h. s. s.

28th. — Pain and cough were very severe all night; was purged four times; stools

highly bilious, but not copious; pulse small. — Ol. ricini, ℥ij. Apply a blister to the part pained.

Vespere. — Feels easier; stools more natural. — Calom. gr. xx. h. s.

29th. — Stools more natural; pain in his side better; cough the same. — Ol. ricini, ℥ij.

Vespere. — Stools dark green, highly bilious; feels little pain; complains of his cough very much. — Calom. gr. xx. Haust. anodyn. h. s. s.

30th. — The cough is rather better this morning, and he feels quite easy in his bowels; passed a good night, and his stools have changed from a dark green to a yellow colour; no feculent matter, but yellow mucus. — Ol. ricini, ℥ij.

Vespere. — Stools highly bilious, with much mucus and feculent matter. — Repet. calom. gr. xx. et haust. anodyn. h. s. s.

31st. — Feels much better; stools dark green viscid mucus, mixed with feculent matter; the pain in the arch of the colon is much less; cough the same. — Ol. ricini, ℥ij.

Vespere. — The pain is quite gone from his belly; stools dark green, with some yellow fæces. — Repet. pilul. gr. xx.; haust. anodyn.

August 1st. — Stools are thick, viscid, tenacious matter, of a dark green colour; no fæces at all, but the pain is decreasing daily. — Ol. ricini, ℥ij.

Vespere. — Dark green stools, with mucus; great headach; tongue furred and yellow; pain in the epigastrium less. — Mist. emet.

2d. — Has vomited well, and threw up much phlegm and green bitter bile; feels his head better, but his pulse is frequent; was purged; stools copious and feculent; was attacked with pain under the mamma, which prevented his breathing, and which still continues. — Apply ten leeches to the part. Mist. purg. ℥ij.

Vespere. — Perspires very freely; mouth affected; copious ptyalism, with the mercurial fetor; cough the same; pain in his right side continues. — Pilul. colocynth. cum calom. et antim. tart. no. 1. nocte manequæ; haust. amar. cum sennâ, ℥ij.

3d. — Symptoms as before. — Introduce a seton. Discontinue the pills, and give the blue-pill at night, and the haust. amar. cum sennâ in the morning. Friction twice a day only.

4th. — Feels the pain still severe; copious ptyalism, and the mercurial fetor in his mouth; tongue furred and yellow; belly open; stools natural. — Ol. ricini, ℥ij. Cont. omnia.

5th. — No change. — Mercurial friction only once a day. Cont. haust. amar. cum sennâ, nocte manequæ.

6th and 7th. — Pain somewhat diminished; ptyalism copious. — Mist. purg. primo mane; mist. salin. febrif.; haust. anodyn. horâ somni.

8th. — A great oppression and sharp pain immediately under the sternum, and affecting his breathing; pulse full and slow. — Apply ten leeches to the part pained. Cont. med.

9th. — Much better this morning; feels great relief from the leeches; pulse perfectly natural. — Cont. med.

10th and 11th. — Symptoms nearly as before; copious ptyalism; complains of griping; stools clayey, pale straw colour, but copious. — Cont. mist. purg. præ. mane. Mist. salin. febrif. et haust. anodyn. h. s.

Vespere. — Cough better; stools more natural; complains of cold rigors and free perspiration; also of pain, on pressure, in the seat of the liver and round to the back, but cannot observe any thing like enlargement. — Cont. med.

12th. — Pain very considerable on pressure in the course of the liver; bowels regular; tongue clean. — Decoct. cinchon. ℥j.; acid. vitriol. ℥xxx. M.; a wine-glassful every two or three hours. Apply six leeches to the back part of the ribs. Haust. anodyn. h. s. s.

13th. — Better in every respect, but weak. — Cont. mist. et haust.

14th. — Much better in every respect; his bowels open; stools feculent, mixed with viscid, tenacious mucus. — Haust. amar. cum sennâ; haust. anodyn. h. s.

15th. — Much better. — Cont. — 16th. Ol. ricini.

Vespere. — Stools tenacious, but feculent, and of a good colour. — Haust. amar. cum sennâ, ℥ij.

17th. — Stools quite natural and formed; pain in his side and cough much better, but he feels soreness. — Repet. haust. amar. cum sennâ, ℥ij.

From this time he recovered, and was discharged a few days afterwards.

Remarks. — This case, at its commencement, presented signs of congestion and inflammation of the convex surface of the liver, with a morbid secretion of bile, and accumulations of viscid, tenacious secretions on the alimentary canal. The continuance of pain, and indeed its aggravation, during the time that ptyalism was most copious, led us to surmise that the inflammation had extended to the adjoining serous surfaces. The debilitated state of the patient, and the copious ptyalism, forbade more than a very moderate local depletion. The adoption of tonics, at the same time that a small local depletion was ordered, was indicated by the moist and clean state of the tongue, the great debility, the improved state of the bowels, and the weak but otherwise natural state of the pulse.

CASE LVI.—*Most acute Inflammation of the convex Surface of the Liver, extending to both Lobes.*

THOMAS DUNSCOM, ætat. 30, 1st July, 1820, His Majesty's 46th Regiment. He was transferred this morning into the General Hospital, with most acute hepatitis, which attacked him seven days ago. He was bled to $\bar{3}$ xxx. from his arm, and took some opening medicine during the period he was in his own hospital. At present the pain is extremely acute under the margin of the ribs, which is much increased on pressure, or in taking a full inspiration, and there is a considerable fulness across the epigastrium: pulse sharp and full; skin hot; cough; tongue white and excited; bowels, by his account, regular; no pain in either shoulder.—App. hirud. xvj. parti dolenti. Capiat pulv. jalap. compos. $\bar{3}$ j. statim. Spoon diet.

Vespere.—Medicine purged him copiously, and his stools are black; side easier, but pain still very acute; skin hot; pulse sharp and frequent; tongue moist.—V. S. ad $\bar{3}$ xxx. statim. R Hydrarg. submur. $\bar{3}$ j.; opii puri, gr. ij. M. ft. pilul. duæ, h. s. s. et cras primo mane. Capiat haust. purg. com.

2d.—Pulse 84, and good; skin cool and moist; tongue considerably better; side much relieved; took his purgative; thirst urgent; appetite pretty good.—Capiat mist. salin. compos. $\bar{3}$ jss. tertiâ quâque horâ.—N.B. The blood drawn was cupped, with a considerable coat of buff.

Vespere.—Stools green; side easier; pulse rather quick, but not full or sharp; skin somewhat hot; tongue moist.—R Pilul. aloët. cum calom. ter die; et mist. amar. cum senn. $\bar{3}$ ij. omni nocte. App. catapl. ampl. cum ung. hydr. $\bar{3}$ j. bis die lateri dolenti.

3d.—Side easy; bowels rather costive; tongue excited; pulse full; skin natural; appetite much impaired; great thirst.—R Pulv. jalap. comp. $\bar{3}$ j. statim. Cont. alia.

4th.—Complains of pain at the scrobiculus cordis, which steals down towards the posterior part of the liver; tongue white; pulse full, but not frequent; skin of a natural heat; he is very thirsty; medicine purged him yesterday very freely, and his stools were pretty good.—App. hirud. xx. parti dolenti: postea cont. cataplasma. Cont. med. ut antea.

Vespere.—Pain in his side very little relieved by the leeches; pulse 80, and soft; skin natural; stools green; says he feels very weak, and when he walks about he is quite giddy; tongue moist.—Cont. med. Sago for supper.

5th.—Better considerably this morning; tongue white and furred; skin and pulse as last evening; three stools of a dark colour since last report.—Cont. med. Sumat pulv. jalap. comp. $\bar{3}$ j. statim.

Vespere. — Medicine purged him freely; stools of a dark-brown appearance, and extremely offensive; says he feels great relief from the purging. — Cont. med.

6th. — Stools look better, and he feels easier; gums swollen; pulse calm; skin warm, but moist. — Cont. med.

7th. — Stools of a bright yellow; side pretty easy; he feels a good deal of pain in his loins, and a slight pain in his right shoulder; tongue white and furred; pulse firm and good; skin warm, but moist; great thirst; appetite improving. — Cont. med.

8th. — Complains of increased pain about the left lobe, which shoots across the epigastrium, and towards the posterior part of the liver; pulse calm; skin cool and moist; tongue slightly white and furred; stools of a dark-yellow colour, feculent, and pretty natural; thirst rather troublesome, but his appetite is improving. — App. hirud. xv. parti dolenti; postea cont. cataplasma. Cont. alia, ut antea.

9th. — Side much easier; says he had a restless night, from pains all over his body; stools as yesterday; tongue the same; pulse firm and regular; skin natural; mouth affected. — Cont. med.

10th. — Alvine evacuations of the same appearance; tongue white and furred; side easier; pulse calm; skin natural. — Cont. omnia.

Vespere. — Complains of pain, which impedes his breathing, at the ensiform cartilage; pulse calm and regular; skin cool; stools look much better; tongue clean. — App. hirud. xvj. parti dolenti. Cont. alia.

11th. — The pain complained of last evening relieved by the leeches; considerable fulness across the epigastrium and abdomen still; tongue white in a slight degree, but clean and moist; pulse rather oppressed, and 60 in the minute; heat pretty natural; no particular thirst; appetite better; alvine evacuations bilious, copious, and rather offensive; pain in his loins. — Repet. pulv. jalap. compos. $\bar{3}$ j. stat. Cont. alia.

12th. — Side considerably easier; stools improving; pulse good; skin natural; he complains of being very weak; tongue white in a slight degree, but clean and moist; appetite unimpaired. — Cont. med.

13th. — Stools of a light-green colour; says he feels a slight pain between the ribs of his right side this morning; pulse and skin natural. — Cont. med. Repet. hirud. vj. parti dolenti.

14th. — Side rather painful in the night, and he was obliged to lie on his right side the whole of the night to get any relief; there is considerable fulness and some hardness at the scrobiculus cordis, and he feels some pain on a pressure being made, when it extends towards the posterior part of the liver; tongue slightly white, but clean and moist; gums tender, with slight ptyalism; pulse soft and calm; skin perfectly natural;

stools as yesterday ; no particular thirst ; appetite pretty good ; urine high coloured.—
Cont. med., et cataplasma cum unguent. hydr. 3j. bis die.

15th.—Mouth very sore, with ptyalism ; side easy, but he complains of pain at the ensiform cartilage ; tongue clean and moist ; pulse soft and calm ; skin cool ; bowels open.—Cont. med. ut heri, et app. hirud. vj. parti dolenti.

16th.—Tongue clean, but slightly white ; pulse good ; skin natural ; side easy ; bowels regular.—Cont. med.

17th.—Mouth very sore, with ptyalism ; says he feels some pain still at the ensiform cartilage ; pulse and skin natural.—App. empl. lyttæ parv. parti dolenti. Omit. unguent. hydr. Cont. alia.

18th.—Blister answered well, and he feels better.—Cont. med.

19th.—Pulse, skin, and tongue, natural ; bowels regular ; slight pain still felt at the epigastrium.—Cont. med.

20th, 21st, and 22d.—Side easy ; bowels regular ; tongue clean ; mouth very sore, with ptyalism ; blister discharges a good deal.—Cont. med.

23d.—As yesterday.—Omit. pilul. Utat. garg. alum. sæpè. Cont. haust. amar.

24th.—Says he feels quite well, with the exception of his sore mouth ; ptyalism copious.—Cont. garg. Omit. haust. amar.

25th.—Improving daily.—Cont. med.

26th.—Convalescent.—Cont. garg. Low diet.

From this time he recovered rapidly, was allowed tonic remedies, with more liberal diet, and was discharged, perfectly well, on the 12th of the following month.

Remarks.—This case illustrates well the symptoms and course of the most acute forms of hepatitis, as well as demonstrates the necessity for decided and repeated depletions in order to remove it. The subordinate details of practice were directed to remove morbid accumulations of the biliary and intestinal secretions, and the mercurial treatment was pushed so as to restore the healthy circulation and secretion of the liver.

CASE LVII.—*Acute Hepatitis, with Congestion and Tumefaction of the Liver ; illustrating a very frequent form of Hepatic Inflammation.*

ROBERT MARTIN, admitted 28th December, 1816.

Evening.—Complains of soreness across his chest ; had a purgative on admission ; stools copious, watery, green, feculent ; pulse rather hard, 108 ; tongue whitish.—Pilul. calom. cum antim. ; mist. salin. Apply twenty leeches to the scrobiculus cordis,

29th. — Pain relieved by the leeches, but he still feels it a little. — Mist. purg. $\bar{\text{z}}$ ij. stat. Apply sixteen leeches.

Evening. — Has no pain in his side; pulse small and frequent; stools watery and offensive; tongue moist. — Calom. gr. xx.; pulv. antim. gr. jv.; syr. q. s. Ft. pilul. h. s. s. Mist. salin. cum vin. antim. $\bar{\text{z}}$ ss.

30th. — Stools perfectly natural; tongue white; pulse small and quick, 98 in a minute; feels a general soreness over his belly, and the sensation of a heavy weight on the chest and stomach. — R Mist. purg. $\bar{\text{z}}$ ij.; natron. vitriol. $\bar{\text{z}}$ ss. statim. Apply twenty leeches over his belly. Enema purg.

Evening. — Has still the tightness and oppression in his chest; tongue foul, but moist; stools copious and watery; pulse small and frequent. — Apply a blister to his stomach. Calom. gr. xx.; pulv. antim. gr. jv.; syr. q. s. Ft. pilul. h. s. s. Repet. mist. salin. febrif.

31st. — Feels much less oppression this morning; his tongue is still foul; pulse 96 in a minute; stools copious, feculent, and morbid. — Mist. purgan. $\bar{\text{z}}$ ij. cum natron. vitriol. $\bar{\text{z}}$ ss. statim. Mist. salin. ut antea.

Evening. — Feels much better; tongue cleaner; no oppression at the præcordia; stools copious, black, and watery; pulse small. — Repet. pil. cal. gr. xx. ut antea. Repet. mist. salin. ut antea.

January 1st, 1817. — Has no pain or oppression at the præcordia; tongue cleaner, moist, and natural; had no stool in the night; pulse small and weak, about 80. — Mist. purgan. $\bar{\text{z}}$ ij. stat. Cont. mist. salin. feb. ut antea.

Evening. — Pains and oppression removed; stools more natural; pulse good. — Repet. mist. salin. Haust. amar. cum sennâ, $\bar{\text{z}}$ ij. h. s. s.

2d. — Stools perfectly natural; no pain; tongue cleaner; pulse natural. — Mist. purgan. $\bar{\text{z}}$ jv.

3d. — Stools copious, watery, and feculent; no pain; skin natural; tongue still foul; pulse natural, 74. — Haust. amar. cum sennâ. Repet. mist. salin.

Evening. — Stools more natural and better colour; tongue foul. — Cal. gr. xij. h. s. s. Repet. haust. amar. cum sennâ, p. m.

4th. — Tongue white and moist; stools feculent and scanty. — Ol. ricini, $\bar{\text{z}}$ ij. statim. Pil. hydrarg. cum cal. et pulv. antim. no. 1. ter die. Haust. amar. cum sennâ, p. m.

5th. — Tongue still a little foul; and has yet some obscure pain in the region of the liver, when pressed on both sides. — Cont. pil. et haust. Inung. unguent. mer. $\bar{\text{z}}$ j. mane nocteque.

6th. — Stools more natural; tongue cleaner.

7th. — Recovering rapidly. — Cont. pilulæ, haustus, et frictio.

8th. — Stools more copious and natural. — Repet. med.

9th. — Has no complaint but weakness. — He was discharged on the 10th.

Remarks. — This case illustrates one of the most frequent forms of the acute hepatitis of India; and shews the general mode of practice adopted by us in similar circumstances.

CASE LVIII.—*Inflammation of the concave Surface of the Liver, extending to the Stomach.*

WILLIAM WOODHAM, private, M. E. Regiment, admitted 6th February, 1813, at Wallajahbad, with pain in his stomach and purging. — Ol. ricini, ℥ij.

7th. — The oil has purged him; stools crude and morbid; pain the same. — Repet. ol. ricini.

8th. — Stools a bright-yellow colour; pain spread over the belly, and not at all relieved; pulse full and strong; tongue clean; feels great heat at stomach. — Apply eighteen leeches immediately. Calomel. gr. x. stat.

Vespere. — Bled freely; much easier; not purged. — Calomel. gr. x. h. s. Pulv. purgan. primo mane sumend.

9th. — Medicine has operated very well; stools highly bilious; still complains of uneasiness at stomach, but the heat he complained of yesterday is gone; tongue dry. — R Mist. salin. feb. ℥j.; vin. antim. ℥j.; antim. tart. gr. j. M. ft. mist. A wine-glassful every two hours.

Vespere. — Stools crude, with undigested food; pain at the stomach the same. — Apply a blister. Calomel. gr. viij. h. s. s.

10th. — Blister rose well; the heat and pain at stomach have disappeared; tongue moist and clean; pulse good. — R Aq. Cheltenhamii, ℥xij. stat.

Vespere. — Took a second dose of the waters, which operated fully; stools are marked with a little bile, but still crude. — Calomel. gr. viij. h. s.

11th. — Much better in every respect. — Repet. aquæ, ℥xij. As this had no effect, at twelve o'clock repeated the draught, which also had no effect. — *Three o'Clock*, P.M. Ol. ricini, ℥ij. stat.

12th. — Stools copious, frothy, and bilious; no heat or pain at stomach; mouth tender. — Repet. ol. ricini, ℥ij.

Vespere. — Stools copious, of a very dark-yellow colour; thinks himself better in every respect.

18th. — Much better; motions becoming quite natural. — Repeat the purging draught, \mathfrak{z} xij. every morning, till the 23d, when he was perfectly recovered, and returned to duty.

Remarks. — This was evidently inflammatory action of the liver, extending to the stomach, accompanied with irritation from the lodgment of acrid bile.

CASE LIX. — *Inflammatory Action commencing in the Surface of the Liver, and extending to the internal Structure, with Tumefaction, &c.*

WILLIAM JACKSON, 7th Company, ætat. 37 years, admitted 3d May, 1817. Complaints of severe pain in his right side, and a feeling of general weakness; tongue foul. — Mist. purgans. Apply twenty-four leeches to his side.

Evening. — Pain still continues; pulse strong and vibrating; tongue clean. — Apply thirty leeches. Cal. gr. xx.; opii, gr. ij. h. s. s.

4th. — Feels much easier this morning; tongue clean; pulse 100 and hard; great thirst; no heat of skin. — Mist. purgans. Mist. salin. febrif.

Evening. — Pulse still hard, quick, and vibrating; pain is less, but he still feels it; can breathe with more ease; tongue cleaner. — Apply twenty leeches. Repet. cal. gr. xx.; opii, gr. ij. h. s. s.

5th. — Pulse 84; tongue cleaner; pain almost removed. — Pulv. purgans. Mist. salin. febrif.

Evening. — Pulse hard and strong; but he has no pain; and his stools are quite natural. — Mist. salin. febrif. Cal. gr. xx. h. s. s.

6th. — Stools natural; has still the pain very slight; pulse natural; skin cool; tongue clammy. — Rub in \mathfrak{z} j. ung. mercur. on the side three times a day. Cont. mist. salin. feb. Pil. aloë. cum cal. no. 1. four times a day.

Evening. — Pulse quicker than usual; feels less pain; has had stools. — Cont. pil. et mercur. frict. ut antea.

7th. — The pain is stationary; pulse is better; stools improved; tongue continues foul; has a tolerable good appetite; a disagreeable taste in his mouth. — Cont. frictio et pil. ut antea.

Evening. — Tongue foul; pain diminished; pulse quick and full. — Cont. pil. aloë. cum cal. ut antea. Cont. mer. frictio, ut antea.

8th. — Pulse much better; stools natural, but lax; otherwise no change. — Cont. pil. aloë. cum cal. Cont. frictio.

Evening. — Had fever this morning at twelve o'clock; his skin is moist; pulse frequent; stools better; more natural. — Cont. pil. et frictio.

9th. — Much better; still feels the pain a little when he moves; stools natural; pulse the same; tongue excited; no fever. — Cont. pil. aloë. cum cal. et frictio, ut antea.

Evening. — Has slight fever this evening; tongue cleaner and less excited; pulse quick. — Pulv. Doveri, ʒj. h. s. s. Cont. pil. &c. ut antea.

10th. — Feels much better; pulse 78; perfectly natural; tongue cleaner; perspired freely. — Cont. pil. et frictio.

11th. — The pain has shifted to the right iliac region, and extends to the liver; pulse 72 in a minute, quite regular; stools feculent, but tenacious; tongue foul. — Mist. purgan. ʒij. Cont. pil. et frictio. Enema purgans.

Evening. — Tongue cleaner; skin hot and moist; pulse quick; the pain in his side the same. — Haust. anodyn.

12th. — Feels better this morning; pulse more natural. — Cont. pil. aloë. cum cal. four times a day. Cont. frictio. Haust. amar. cum sennâ, ʒij. nocte maneque.

Evening. — There is a fulness in the region of the liver, which we have not felt before, although the side has been examined; his tongue is clean; pulse sharp, but not full. — Cont. frictio, pil. et haust. amar. ut antea.

14th. — Tongue foul; stools quite natural; pulse good; the enlargement of the liver continues; mouth not affected. — Cont. pil. aloë. cum cal., et frictio ung. mer. ut antea. Haust. amar. cum sennâ, ʒij. nocte maneque.

Evening. — The enlargement of the liver is the same; his stools are natural. — Cont. pil. aloë. cum cal. ut antea, et frictio. Haust. amar. cum sennâ, ʒij.

14th. — The pain continues; tongue clean; stools natural, but lax. — Cont. pil. aloë. cum cal. Haust. amar. cum sennâ, ʒij. Cont. frictio.

15th. — Stools green coloured and crude; feels better. — Mist. purg. ʒjv.; pilul. aloë. cum calom. no. 2.

Evening. — Much better; his mouth is becoming affected; pain the same. — Pilul. aloë. cum calom. no. 2.; haust. amar. cum sennâ, ʒij.

16th. — Mouth very little affected; the tumour in the liver the same; feels generally better; tongue foul, but moist; stools natural consistence, but dark-green colour, bordering upon black. — Repet. pilul. aloë. cum calom. no. 2. Mist. purg. ʒjv.

Evening. — Feels sharp pain this evening on the left side; pulse not accelerated; stools green and feculent. — Apply twelve leeches to his side. Cont. unguent. mercur., pilul. aloë. cum calom. no. 2, et haust. amar. cum sennâ, ut antea.

17th. — The pain has left his side since the leeches were applied; stools natural; tongue the same. — Cont. pilul. aloë. cum calom. Cont. haust. amar. cum sennâ, ʒij. Cont. frictio unguent. mercur. ʒj. four times a day.

Evening.—Much better. — Cont. pilul. aloë., haust. amar., et frictio.

18th. — Much better; stools quite natural. — Repet. pilul. aloë., et haust. amar., et cont. frictio.

19th. — Feels that he is getting better; the tumour is much less. — Omit. pilul. aloë. Pilul. hydr. cum calom. no. 1. four times a day. Haust. amar. et frictio, ut antea.

20th. — Is better. — Cont. pilul. hydr. cum calom. ut antea. Repet. haust. amar. cum sennâ, $\bar{5}$ ij. Decoct. corticis Per. $\bar{1}$ bj., a wine-glassful four or five times a day. Cont. frictio.

21st. — The tumour on the side almost gone; feels better; stools natural. — Cont. omnia.

22d. — Mouth sore. — Cont. ut antea. Decoct. cort. ut antea; two glasses punch.

23d. — Much better; mouth sore. — Rub in $\bar{3}$ j. unguent. mercur. nocte maneque. Repet. pilul. et haust. amar. nocte maneque.

Evening. — Omit. pilul. Cont. friction and bark.

24th. — The pain and tumour are quite gone; mouth continues sore; feels weak. — Omit. mercur. Cont. decoct. cinch. cum tinct. opii, $\bar{5}$ j.

25th. — Much better; he sleeps ill; stools quite natural. — Cont. bark and gargle.

26th. — Improving. — Cont. bark. Meat diet.

27th. — Haust. amar. cum $\bar{3}$ ss. tinct. cardamom. comp.

He was discharged, cured, on the 31st.

Remarks. — The circumstance chiefly deserving notice in this case is the super-vention of tumefaction of the liver upon the arrest of the inflammatory action by means of depletion. This seems to have arisen from congestion of the vessels of the liver, which may either accompany or supervene to inflammation, when depletion is not pushed sufficiently far, or not followed immediately by the mercurial action. The subsidence of the tumefaction took place soon after the mouth became affected; as, indeed, we have observed it to do on many occasions.

CASE LX. — *Acute Hepatitis in a recent comer to India, with great Congestion and Tumefaction, Accumulations of morbid Bile, and of morbid intestinal Secretions. Treatment, active and decided.*

— VAUGHAN, ætat. 32, His Majesty's Royal Regiment; has only been in India two months; admitted into the General Hospital, Madras, this evening, 18th October, 1820. Says he was attacked three days ago with violent pain in his right side and shoulder;

but he was either not in the way of obtaining assistance, or did not apply for it. He now complains of severe pain when he takes a full inspiration, or when the slightest pressure is made upon his side. Stools are scanty, griped, with some tenesmus; face flushed; pulse hard and full, 88; skin dry, but not hot; tongue white and furred, rather moist; much thirst; no appetite; cannot lay on either side without excessive pain, and is obliged to lay on his back day and night. He has a short, teasing cough.—Twenty leeches were immediately applied down the spine and along the right hypochondriac region, and thirty-six ounces of blood were taken from a vein.

Ten o'Clock, P. M. — The first cup of blood which flowed from the vein was exceedingly thick and black; the second was cupped, and had the inflammatory buff coat, with a great deal of serum; the last few ounces were of a firm, compact, flat surface, with very little serum and very little buff coat.—Calomel. gr. xx.; pulv. antim. gr. jv.; opii puri, gr. ij. h.s.s. Enema purgan. Mist. salin. febrif. every three hours.

19th. — Has been copiously purged, and the stools are extremely offensive, feculent, and morbid; pain relieved, but still severe; pulse 84, soft and regular; skin more natural; tongue less excited.—Apply twenty leeches to the region of the liver. Pulv. purg. ʒj. Cont. mist.

Evening. — Well purged, motions morbid and acrid; pain still distressing; pulse 80, full, and a sharp beat; tongue the same.—Repeat the leeches, xx.; repet. calom. et mist.

20th.—Has not had any motion since last evening; pain considerably relieved by the leeches; tongue moist and clean; skin cool, and with a gentle perspiration; pulse 74, full, soft, and regular; he can take a full inspiration without pain, and he can lay on the left side.—Repet. enema purg. et haust. purg.; cont. salin. mist.; and apply a large poultice over the whole epigastric and hypochondriac region.

Evening. — Stools extremely copious, feculent, and very morbid; is very much better; pulse, skin, and tongue, natural.—Pilul. aloë. cum calom. no. 1. three times a day. Mist. amar. cum sennâ, ʒiij. nocte maneque. Cont. poulticing, &c. &c.

21st.—Stools scanty and dark coloured; slight pain in the side.—Pulv. jalap. comp. ʒj., and cont. omnia.

These medicines were continued daily till the 25th, motions being always morbid, offensive, and crude; he complains this morning of return of pain.—Fifteen leeches were applied immediately; and the purgative medicines, poultice, &c. continued; and a large blister was afterwards applied on the right side.

28th.—Mouth slightly affected; pain less; motions green, viscid, and tenacious, and very copious.—Cont. med.

30th.—Mouth very sore; considerable ptyalism.—Omit the pills. Cont. mist. amar. cum sennâ; milk diet. Blister discharging freely; pulse much accelerated; pain diminished. Cont. mist. salin., poultice, &c. &c.

Nov. 3d.—Stools copious, feculent, and of a dark-yellow colour; more natural; considerable fulness about the liver, and the ribs are evidently raised considerably; has rigors.—Cont. poultice and nitro-muriatic lotion.

6th.—Stools perfectly natural; enlargement of the liver subsiding. Cont.

9th.—Stools regular; pulse 62; ptyalism diminished; no rigors; bowels not sufficiently acted upon.—Pulv. jalap. comp. ʒj.

11th.—Stools copious; green, viscid, tenacious matter; has more pain in his side, chiefly felt at the margin of the ribs and towards the posterior part of the liver, and it is increased on a full inspiration; has pain in his shoulder, which shoots up from the loins; no rigors or shivering; mouth still sore.—Repet. pulv. purg., and apply sixteen leeches to the posterior part of the liver. Cont. poultice and nitro-muriatic lotion.

Evening.—Fully purged; stools offensive, and almost black.—Cont. haust. amar. cum sennâ; mist. salin. febrif.; poultice, &c. &c.

13th.—Has a dull, heavy pain in the side, but not at all sharp; his mouth is quite well.—Pilul. aloë. cum calom. three times a day. Cont. omnia.

16th.—The fulness and enlargement of the side very much reduced, but he has still a dull pain; stools improving very much.—Cont. ut antea.

23d.—Gums again affected.—Discontinue the pills. Cont. alia.

30th.—Ptyalism continues; he has been gaining ground daily, and his bowels are becoming quite regular; but he had another attack of pain in the side last night, precisely similar to that which he had on the 11th.—Apply sixteen leeches. Pulv. purg. ʒj. stat. Repet. poultice and lotion.

Dec. 1st.—Much better; the pain greatly relieved.—Cont.

This system was continued for near three weeks longer, with the occasional application of leeches; and he returned to his regiment, perfectly recovered.

Remarks.—During the treatment of this case, the morbid condition of the alvine excretions was almost incredible till the last week of his convalescence, when they became perfectly healthy, and required nothing more than the mist. amar. cum sennâ. He was regularly purged every day; and the mass of foul, morbid matter that came from him was astonishing. Could this have arisen from accumulations or morbid

secretions? Whatever may have been its source, the laxatives used completely removed it; which shews, at least, that this state of the bowels was not caused by purging. He acknowledged that he had not been well from his first arrival in India, but that he did not like to complain till he was obliged to do so. This is a sad mistake, which many fall into, and should be guarded against; as we are quite sure many valuable lives are lost by it, not only amongst the soldiers in India, but amongst the higher ranks of society. This man lost about one hundred ounces of blood during the first twenty-four hours of his treatment, and yet local depletions were still necessary subsequently. The appearances presented by the different portions of the blood taken by venesection on his admission are interesting, and indeed important in a pathological point of view.

CASE LXI. — *Inflammation of the superior Surface and Substance of the Liver.*

GEORGE LEYSTRANGE, Light Company, ætat. 26, admitted 16th May, 1817. . Complaints of general pain over his chest and body.—Mist. purg. ζ jv. Apply twenty-six leeches to the scrobiculus cordis.

Evening.—Pulse small, and 120; skin hot, and in a full perspiration, which is very offensive; has been relieved by the leeches and purging mixture, which operated well; tongue foul, white, and excited; great pain across his chest and side, which affects his breathing; pain in his shoulder; considerable fever and great thirst.—Apply forty leeches. Calom. gr. xx.; mist. salin. febrif.

17th.—The pain in his side is completely removed; his tongue is foul and white; heat and fever all gone; pulse hurried; a very bad taste in his mouth.—Mist. purg. ζ jv.

Evening.—The pains have left him; feels his head giddy; pulse quick; stools viscid and morbid; tongue cleaner.—Pilul. calom. gr. xx.; haust. amar. ζ ij.

18th.—Much better this morning, but felt pain in his side last night, which still continues; tongue very foul and loaded.—Apply thirty leeches to his side. Mist. purg. ζ jv. statim.

Evening.—The pain in his side is no better; pulse quick; skin not hot.—Calom. gr. xx. statim. Pulv. Doveri, \mathfrak{z} j. h. s. s. Apply a blister to his side.

19th.—Perspired a great deal in the night, and was not purged at all; tongue foul, and covered with a white coat of mucus, but not moist; the pain is easier this morning; the blister has risen, and is painful; he is at this moment in great perspiration, and

all his clothes are wet; pulse not so full, smaller, and only 90 in a minute.—Mist. purg. \bar{z} jv.

Evening.—Pulse 96; tongue foul, and covered with thick mucus; has a bitter taste in his mouth; feels the pain very slight.—Mist. emet.; haust. anodyn. h. s. s.

20th.—Has still a bitter taste in his mouth, but not so much as it was; has less thirst; tongue dry and furred; still feels pain in his belly and side when he moves suddenly; pulse much more regular, and not so quick.—Apply twenty leeches. Mist. purg. \bar{z} jv. Cont. mist. salin. ut antea.

Evening.—The pain in his side is removed by the leeches; his mouth is very slightly affected; pulse the same; stools watery, of a pale colour; tongue cleaner than it was.—Pilul. hydr. cum calom. no. 1. three times a day. Haust. amar. cum sennâ, \bar{z} ij. nocte maneque.

21st.—Pulse good; tongue clean; mouth sore; stools natural; pain all gone.—Repet. pilul. et haust. ut antea.

Evening.—Much better.—Cont. pilul. et haust. amar. ut antea.

22d.—Pulse good; stools watery, with some fæces; had slight pain last night.—Mist. purg. \bar{z} jv. Cont. pilul. ut antea.

Evening.—Much better; can walk to the Dispensary.—Pilul. hydr. et haust. amar. ut antea.

23d.—Still feels a slight pain; tongue clean; mouth continues sore; had no stool.—Apply a blister to the part pained. Cont. pilul. et haust. amar. cum sennâ. Rub in on his belly \bar{z} j. unguent. mercur. night and morning.

Evening.—The blister has done its duty, and he is much better; stools natural.—Cont. pilul. et haust. amar. Continue to rub in.

24th.—No pain at all in his side; his mouth is sore; stools watery.—Cont. frictio. Omit. pilul. Haust. amar. cum sennâ, \bar{z} ij.—*Evening.* Cont.

25th.—Feels quite well, only that his mouth and blister are still sore; stools perfectly natural.—Omit. the unguent. mercur. Cont. haust. amar.—*Evening.* Cont.

26th.—Feels quite well.—No medicine.—27th.—No medicine.

28th.—Ol. ricini, \bar{z} ij.—*Evening.* Well purged.

29th.—Quite well.—No medicine.—30th. Ol. ricini, \bar{z} ij. Discharged.

Remarks.—The offensive perspiration in this case is not an unusual symptom of inflammation of the substance of the liver, accompanied with deficient secretion of bile and torpid bowels. The treatment was as decided as circumstances would permit. The exhibition of the emetic on the evening of the 19th was prejudicial.

CASE LXII.—*Acute Hepatitis, treated by Leeches, Purging, and Mercurials.—Recovery.*

SERJEANT BAIRE, ætat. 35, admitted 30th December, 1816. Was attacked on the 27th with pain in his side and febrile symptoms, for which thirty-six leeches were applied, and calomel and purgatives administered; the pain is much less, but his tongue is foul and dry, and skin hot.—Mist. purg. ℥iij.

Evening.—Pulse 72; tongue white and furred; pain easier, except when he coughs; has been well purged, and was griped; no increase of heat.—Apply eighteen leeches to his chest. Calom. gr. xx.; pulv. antim. gr. jv.; syr. q. s. Ft. pilul. h. s. Mist. salin. febrif.

31st.—The heat and pain in his side are removed; pulse small, about 60 in a minute; was not purged in the night; skin cool; tongue white and furred.—Mist. purg. ℥iij. cum natron. vitriol. ℥ss. R Mist. salin. febrif. ℔j.; vin. antim. ℥ss. M.; a wine-glassful every three or four hours.

Evening.—Has been well purged; stools a dark-green gelatinous matter this morning; they are now morbid, offensive, and feculent; tongue still foul, but cleaner and moister than in the morning.—Calom. gr. xij.; pulv. antim. gr. jv.; syr. q. s. Ft. pilul. h. s. s. Cont. mist. ut antea.

Jan. 1st, 1817.—Pulse 78; tongue dry and white, with white mucus on it; skin cool; no pain in his side at all; heat natural.—R Mist. purg. ℥iij.; natron. vitriol. ℥ss. M. ft. haust. stat. Repet. salin. mist.

Evening.—Tongue foul; no pain; stools watery.—R Pilul. hydr. cum calom. and pulv. antim. no. 1. three times a day. Haust amar. cum sennâ, ℥ij. h. s. s.

2d.—Feels quite well, but his tongue is still foul; stools scanty, but natural.—Repet. mist. purg. ut antea.

Evening.—Tongue foul; says he has no complaint; stools watery, with lumps of white mucus.—Pil. hydr. cum calom. et pulv. antim. no. 1. three times a day. Haust. amar. cum sennâ, ℥ij. nocte maneque.

3d.—Tongue cleaner; was purged three times in the night.—Mist. purg. et pilul. ut antea. Repet. haust. amar. h. s.

4th.—Tongue the same; no pain at all.—Mist. purg. cum natron. vitriol. ℥ss. stat. Pilul. cathart. no. 1. three times a day. Mist. amar. cum sennâ, ℥ij. nocte maneque. Omit the pilul. hydr.

5th.—Mouth sore; tongue still foul; stools watery and brown.—Pulv. purg. stat. Cont. pilul. et mist. amar. cum sennâ.

From this time he rapidly recovered, and was discharged, quite well, in a few days.

Remarks.—This case is given with a view of shewing the more frequent form of acute hepatitis in India. Local depletion, when decided, is generally sufficient in those who have resided long in the country. The motions in this case were similar to what are usually observed in the more common cases of the disease.

SECTION II.

Of the more Chronic Inflammations of the Liver, and Organic Diseases of the Organ.

CHRONIC inflammations of this viscus may supervene primarily, or the acute forms of the disease may have been so far subdued as to subside into a slow, inactive state. When chronic inflammation takes place primarily, it generally is seated in the internal texture of the organ, and often gives rise to but few local symptoms, and but little constitutional disturbance. But chronic is a term which conveys with it no precise idea, and merely signifies a slow state of inflammatory disorder, presenting every grade, from that state of disease which may be considered as only slightly deviating from the healthy action, and which may continue for a great length of time, giving rise to various organic changes, to that which runs its course rapidly, and terminates, either one way or another, in a very few weeks. When this form of inflammation remains after the more acute phenomena have been subdued, it has generally its seat in the substance of the liver, but not uniformly: it may be seated in the surfaces; for the active inflammation, which has been followed by the effusion of coagulable lymph upon the surface of the organ, and the formation of adhesions between it and adjoining parts, may be, to a certain extent, rekindled, after it has been either altogether or nearly extinguished, and the vascular action reinduced may assume a slow and sub-acute form. It should also be recollected, that,

although chronic inflammations of the liver may follow upon acute attacks, the latter may also supervene to the former, and actually do so on many occasions, particularly when the patients have been exposed to energetic exciting causes, or to an injudicious regimen and treatment. This should always be kept in mind during the treatment of both acute and chronic forms of inflammation of the liver; for it should be an object of importance with the practitioner to prevent active inflammations from degenerating into chronic, and the chronic from being converted into active disease.

Chronic inflammations of the liver generally commence, and are accompanied, with much disorder of its functions. There are generally appearances of either disordered biliary secretion, or obstruction to the discharge of this fluid into the duodenum. The bile is seldom in due quantity; or, if its quantity be not materially diminished, it is generally much changed from its healthy state. Sometimes it seems to be more abundant than natural, but this generally arises from obstructions to its free discharge into the duodenum, and its consequent accumulation in the hepatic ducts and gall-bladder. Torpor of the organ, when it accompanies a state of chronic disease of the viscus, may also lead occasionally to attacks of more acute disorder, attended with an increased and vitiated secretion of this fluid; and this effect may proceed from the elements of bile accumulated in the blood, owing to the deficient function of the liver, irritating or exciting it to increased or morbid action. The secretion of bile may, therefore, be various in quantity, according to the particular circumstances of the case; but it is more generally diminished, and almost always somewhat changed in quality, as far as we may judge from the appearance of the motions and its influence upon the chyme, as shewn in the digestive and assimilative functions.

As chronic disease of the liver may present every grade of activity, down from what we have denominated active inflammations of the viscus to the slightest deviation from a healthy function, which may be followed by organic change of the organ,—so the symptoms indicating its existence must vary in severity in particular cases, and assume more or less distinctive characters. When the internal structure of the viscus is the seat of the vascular disorder,

and if this be of a slight and inactive character, then the symptoms will be often so slight as not to engage the attention of the patient, and, consequently, not to come under the notice of the practitioner until important organic changes may have taken place in the organ, and the concomitant symptoms, such as wasting of the body, with disorder of the digestive organs, lowness of spirits, &c., shall have engaged the attention of the patient. If the surfaces of the liver become at all involved in the disease, the symptoms are then of a more distinct and acute character; and although they may be in some cases long neglected, owing to the little constitutional disturbance accompanying them, yet they more generally attract notice.

In the severer cases of chronic inflammation of the liver, the symptoms will be nearly resembling those we have already described as characterising the more active forms of the disease, only much less acute and less marked, and consequently less alarming to both patient and physician. The kind, and pathological relations, of the symptoms are, however, the same; they only differ in degree, and therefore cannot require again to be described. They also, in some instances, may be correctly considered as indicating the part of the organ diseased; but, in the chronic forms of hepatitis, the relations of the symptoms to particular textures or parts of the biliary apparatus are only to be partially relied upon, and are to be distrusted in proportion as the signs become less acute and less distinctly marked.

In the slightest and most chronic forms of inflammatory action of the biliary organs, the symptoms are often indistinct and not very precise; and it is chiefly in cases of this description, by means of disorder of the digestive and assimilative functions, that we are led, in many instances, to infer the existence of disease of the liver. The loss of flesh; the dyspeptic symptoms, particularly the slow and painful digestion, accompanied with acid and acrid eructations, flatulency, nausea, and sometimes vomiting, torpid state of the bowels, or dark-coloured, offensive, slimy, greenish-coloured, tenacious, or watery and muddy motions; the frequent calls to stool, and the scanty and morbid state of the evacuations; the dark-coloured and disordered condition of the urine; the distension and oppression at the epigastrium and right hypochondrium; the occasional aching pain and weight in these

situations; the uneasiness and pain about the right shoulder or shoulder-blade; the slight acceleration of the pulse towards evening, with an irritable beat, and considerable heat and restlessness through the night; the burning heat of the palms of the hands and soles of the feet in the evening, and chilliness in the morning; the white, foul, and excited tongue; the bitter or disagreeable taste of the mouth; the hardened state of the gums; the sallow and tallowy appearance of the countenance, and either yellow or pearly-white colour of the eye; the sickly and leuco-phlegmatic character of the body generally; and the elevation of the shoulders,—are the principal symptoms by which we are guided in determining the existence of chronic inflammation of the internal structure of the liver.

When the surfaces are the seat of disease, the pain is generally then more marked, and as the superior or the inferior surface is chiefly affected, so will more or less disorder be referred to the chest in the one case, or to the stomach and bowels in the other. When the superior and exterior part of the right lobe is the seat of disease, then the patient reclines with most ease on the right side, and feels more or less acute pain, or a dragging sensation, upon turning to the left; but when this sensation is felt, we may generally infer the existence of adhesions between the lobe of the liver and the right side. The back is generally the easiest position to recline upon, and a slightly bent posture is often preferred.

In every case, as we have already stated, of disorder referrible to the liver, careful examination of the region of the organ should be made, both by the hand and the eye. We have given, in a former page (436), directions to this effect. But in no case should the examination be made roughly, or in such a manner as to excite much pain. Although we know no person more desirous than ourselves that such examination should convey every information possible for it to convey, yet we must protest against examinations being made suddenly and with much force. The patient is seldom prepared for it; and as the muscles are generally relaxed at the time of examination, much violence is apt to add to the already existing mischief. It should be recollected, that the liver, when inflamed or congested, is often also softened in its texture, and more liable to suffer from a rough mode of examination.

We have known cases wherein much increase of suffering was occasioned by it, and wherein chronic and sub-acute attacks of disease were converted by it into active inflammation. More precise knowledge will be generally obtained when the examination is made gently and carefully, than when it is made otherwise. We should also take care, when endeavouring to obtain information in this way, that we satisfy our minds distinctly respecting the existence of tumefaction or distinct tumour, or the absence of either. In chronic inflammations of this organ there is generally much loss of flesh: enlargements of the organ, or distinct tumours from abscesses may then be distinctly felt, and many of their relations with the adjoining parts may sometimes even be detected. This is the case chiefly when tumefaction or abscess takes place on the superior and exterior surface of the liver, or near its anterior edge. When organic changes of the above description are situated in the centre of the liver, or at its superior and posterior aspects, then little more can be detected than tumefaction and fulness in the right hypochondrium and epigastrium, with a descent of the edge of the organ considerably beneath the margin of the ribs. When these changes are situated towards the inferior and posterior surface, then there is generally neither much fulness nor tumour in the above situations, even when tumour and enlargement actually exist. The stomach and colon give way before tumours or abscesses pointing in this direction; and thus tumefaction is seldom present, and if it be, it is usually of a diffused and undefinable kind. In such cases there is usually much oppression and sense of load at the pit of the stomach, particularly after a meal, with urgent symptoms of dyspepsia, and acrid, acid, and flatulent eructations, sometimes with vomiting, or rejection of the contents of the stomach, sometimes without much retching or exertion, and a disordered state of the biliary organs, with irregularity of the bowels and morbid condition of the stools.

The terminations of chronic inflammation of the liver are various. The greater number of them, however, may be viewed in the light of advanced stages of the inflammatory state; others merely as organic changes to which this state invariably leads in particular habits and constitutions, rather than as actual terminations of chronic inflammatory action, since the vascular

disorder may be considered as still existing. As in the more acute forms, of disease, those forms now under consideration may terminate in resolution by a gradual diminution of the morbid symptoms, and a return of the healthy actions of the diseased organ, and of those related to it in function. They may also give rise to a more acute form of disease, or to organic changes of a serious and even fatal tendency. Amongst the former are, active inflammation of the organ, or of the gall-bladder and ducts, and dysentery. The latter embraces all the organic changes to which the organ is liable. These are not generally so varied in warm climates and in India as in temperate countries. The chief organic changes met with in the East, consequent upon inflammations of the liver of a more or less chronic kind, are the following.

Collections of matter may form in the substance of the organ consequent upon chronic inflammatory action, as well as from the more active state of disease. When the purulent matter is collected into one large abscess, it generally nearly approaches the appearance of abscess consequent upon active inflammation, and will receive attention when the subject of abscess comes specifically under consideration. Not infrequently, however, very minute abscesses are scattered through the substance of the liver, both with and without the appearance of a distinct cyst, the matter collected being of a firm or cheesy consistence, and yellowish white colour. Sometimes this consistent kind of matter does not fill completely the cavity containing it: it seems as if the watery portions of the matter had been removed by absorption, and thus the more consistent part fills imperfectly the cavities in which it is contained.* The substance of the organ intervening between the purulent deposits is sometimes more vascular than usual, and of a brick-red colour; and at other times not materially changed from the healthy colour and consistence.

The liver, in many instances of long-continued and slight inflammatory action, becomes much enlarged, particularly its right lobe. This appears to arise from the deposit of lymph in the interstices of the structure, which

* See Plate XVIII.

deposit becomes dense, and closely resembles an organised substance, most probably from the absorption of its watery portions. The enlargement is often accompanied also with deposits of purulent matter in various parts of the organ, with a friable state of its texture, and a dark-coloured and congested condition of both its internal structure and surfaces: the latter are generally much darker than natural, and often variegated with lighter streaks and small spots.

When the deposition of lymph in the structure of the liver is attended with greater density of its organisation, either partially or generally, the change has been ascribed to a specific organic change; and a true scirrhus condition of the organ has been considered as the result. This state seems to us to be merely the consequence of very slow inflammatory action, with a deposit of organised matter, and an increased consistence of the reticulated or cellular parenchyma of the viscus, and frequently with an effusion of lymph in the granulated tissue composing the greater portion of its internal structure. It seems to us also, that the consistence of the organ met with in cases of chronic disease characterised by enlargement, is more the consequence of the activity of the inflammatory action from which it proceeds, and the habit and constitution of the patient, than any other cause; the organ being more friable and congested, the more acute the previously existing disease,—and more firm and more closely resembling a true scirrhus and semi-cartilaginous state, the more chronic or slow the inflammatory action which had existed.

Tubercles of various kinds,—some apparently encysted, others without any evident cyst or distinct envelop, and, when divided, presenting either a concentric or radiated texture, varying in consistence from a gristly or cartilaginous state to one of semi-fluidity, occasionally filling completely the cavities in which they are contained, particularly when they approach a state of fluidity, and at other times, when their consistence is greatest, leaving vacuities between their circumference and the parts of the liver surrounding them,*—are often severally detected in examinations of the more chronic

* See Plate XVI.

forms of hepatic inflammations. In many cases, the substance of the liver containing these tubercular formations presents little or no evidence of much inflammatory action having existed, at least recently, in the organ. The tuberculated liver is often also enlarged, and occasionally it is much firmer in its texture than usual. When signs of co-existent inflammation of the internal structure are present, there is frequently also greater friability; but this is not uniformly the case. Sometimes the substance of the viscus presents a gristly or cartilaginous appearance, and is lacerated with greater difficulty than usual. Such appearances are chiefly remarked in the most chronic cases.

In these cases also, more particularly in those addicted to the use of spirituous and intoxicating liquors, the substance of the liver is obscurely tuberculated, of a cheesy consistence and texture, and of a deep nankeen-like colour: it is generally, at the same time, more or less enlarged. In many chronic cases of diseased liver, arising from the above cause, we have found the internal structure of the organ of a parboiled and scabrous appearance, drier and more spongy than natural, and, when divided by a scalpel, or torn asunder, presenting a more or less pale colour, and great inequality of consistence, small rough eminences being surrounded by soft, grayish, and spongy matter. In some of these cases, the substance of the viscus is of a grayish-brown colour. Conjoined with this condition, the size of the liver is often diminished, its vessels nearly without blood, the hepatic ducts devoid of bile, and the gall-bladder either empty or containing a small quantity of a pale, straw-coloured, watery fluid, scarcely resembling bile. This state of the hepatic vessels, biliary ducts, and gall-bladder, is often also conjoined with scirrhus enlargements, tuberculous disease, with atrophy, and with many of the other very chronic states of the liver now described.

When the liver, owing to very slow and long-continued inflammatory action, has become tuberculated, or enlarged with scirrhus hardening, then it may generally be felt projecting from under the margins of the ribs, particularly on the right side. But these forms of organic change are less frequently observed in India than in Europe. The functions of the liver, in cases of tubercular disease, of scirrhus enlargement or hardening of the

viscus, and of the other organic changes now described, are always very seriously disordered. There are present a diminished secretion of bile, with change from its healthy state; much disorder of the digestive and assimilating functions; wasting of the body; drowsiness and pain over the eyes; a disagreeable taste of the mouth; a tallowy or unhealthy appearance of countenance; an irregular condition of the bowels, with a pale, morbid, and offensive state of the motions; high-coloured or brown urine; frequently a yeasty, whitish, and clayey condition of the stools; and slight acceleration of the pulse towards evening, with heat and dryness of the palms of the hands, and many of the symptoms formerly enumerated.*

In many very chronic cases the liver becomes smaller than natural; and in some it is very much diminished in size. Such cases cannot often be detected during the life of the patient, otherwise than by the obstinate torpor of the biliary functions, the deficiency of bile in the stools, and the sunk state of the epigastrium and margin of the false ribs, when the patient is examined in a reclining position. These, viewed in relation to other symptoms, may sometimes guide the judgment of the practitioner; but they cannot be much relied upon. Atrophy of the liver may be the consequence of slow inflammatory action; but on this point it is difficult to decide: even although it may evidently result from this source in some cases, we cannot infer that it does so always. We have, however, met with several cases in which the wasted state of the organ was attended with a marked cicatrix on its surface, and extending through the greater part of the whole thickness of its substance. In such instances the cause of the diminished size of the organ was manifest; and the evidence of abscess having existed in it many years before was complete. In one case,† several cicatrices of the liver accompanied this state of atrophy, and gave the surface of the organ a singularly radiated appearance.

The appearances, then, which are met with on dissection of cases of chronic inflammation of the liver, and which may be considered amongst

* See pp. 471 and 472.

† See Plate XV.

the terminations and consequences of the more chronic forms of inflammatory disease, are abscess, and small collections of matter; tubercles; enlargement of the organ and softening of its texture; increased density and scirrhus enlargements and tumours; enlargement with friability, or with cartilaginous hardening of its structure; a rough, pale, and parboiled-like appearance; a cheesy and tuberculated state of its structure; a spongy and less vascular condition of its internal texture; atrophy, with or without the marks of cicatrices; various colorations of its surface or substance; and adhesions of various kinds to adjoining parts. The above organic changes are very frequently met with in fatal cases of dysentery, particularly that form of the disease which we shall treat of under the denomination of hepatic dysentery, and in bilious remittent fevers and obstinate intermittents. Indeed, they are more often observed, in India, thus complicated than as simple diseases of the biliary organs, and generally they are variously conjoined the one with the other. Owing to this circumstance, organic changes of the liver will not have received from us that copiousness of illustration which they are susceptible of, and which they require, until we shall have considered the different forms of dysentery and types of fever met with in India and other tropical countries.

In addition to these organic changes, which are to be referred chiefly to the substance of the liver, there are others which belong more especially to the gall-ducts. These are collections of very viscid and hardened bile in the hepatic ducts; and biliary calculi in the same situations. We have seldom observed, however, biliary calculi lodged in the hepatic ducts in India. It is very probable, that, when they form in this situation, they become a source of irritation, and, acting as a foreign substance, produce inflammatory action, which soon terminates in abscess. Biliary calculi frequently form, in warm climates, in the gall-bladder, and often produce inflammatory action in this receptacle, or in the cystic or common duct, not infrequently attended with spasm, which often extends to adjoining organs.

The symptoms indicating inflammatory action of the gall-bladder or

ducts cannot always be distinguished from those accompanying inflammation of the concave surface of the liver;—the same irritability of the stomach and irritable beat of the pulse, pain at the pit of the stomach, and disordered state of the bowels, accompany both the one and the other. When, however, the ducts and gall-bladder are inflamed, there is, more generally, a marked deficiency of the biliary secretion, or an entire absence of it from the stools, and jaundice is more constantly present. Frequently also, and particularly if the inflammatory action be attended with spasm, or arise from the irritation of biliary calculi, there is an irregular action of the diaphragm, sometimes hiccup, and occasionally short paroxysms of dyspnoea.

When inflammation attacks the pancreas, it not infrequently extends to the common duct, occasioning occlusion of its canal, and enlargement of the pancreas itself. When this is the case, jaundice becomes complete, and the patient generally sinks under the disorder of the biliary and pancreatic apparatus, and the imperfect state of the assimilating process; marked disease generally supervening also in the small and large intestines, from the absence of bile, and the insufficient changes produced upon matters taken into the stomach in the course of their passage along the alimentary canal.

When inflammation commences in the duodenum and extends to the ducts, the symptoms very closely resemble those we have already noticed as characterising inflammation of the concave surface of the right lobe of the liver; and there generally is present, in addition, considerable pain in the region of the duodenum, proceeding from beneath the right scapula to the right hypochondrium, with a sense of dragging or drawing together of the parts in the vicinity. Owing to the tumid state of the mucous tissue accompanying the inflamed state, and particularly if the inflammatory action extend to the common duct, the opening of this duct into the duodenum will be considerably obstructed, if not entirely occluded, and jaundice will thus supervene as a necessary consequence. Inflammation of the duodenum extending to the ducts, is, moreover, attended with sickness at stomach and vomiting, which generally come on about two or three hours after a meal,

and with a relaxed or irregular state of the bowels, and a light, cream-coloured, and frothy state of the motions.

Jaundice can scarcely be considered in any other light than in that of a symptom of a functional or an organic disease affecting some part of the biliary apparatus. It varies in degree from a slight yellowness to a deep green, or even olive colour: the latter, which has been commonly called black jaundice, is comparatively rarely met with, and is only found attendant upon cases similar to that of Murby, in which was found, upon dissection, great congestion of the liver, accumulations of black viscid bile in the liver and gall-bladder, and complete obstruction of the ducts. A slight form of jaundice is often seen accompanying bilious inflammatory fever and bilious remittents; but in such cases this symptom seems to arise rather from an increased secretion of bile than from any obstruction to its discharge into the duodenum. It may also arise from the absorption of bile and morbid secretions from the internal surface of the alimentary canal, especially when active purging has not been instituted sufficiently early in the disease. That jaundice has very seldom supervened in our practice, unless when it obviously seemed to depend upon structural disease of some part of the biliary apparatus, or upon obstruction of the ducts, has evidently been owing to the uniform attention paid to the free and full evacuation of the bowels. In the practice of those who place less reliance upon this particular mode of treatment, we believe that jaundice is more frequently met with as a symptom of hepatic diseases.

It is unnecessary to add any thing respecting the causes of chronic inflammations of the liver, in addition to what we have already stated respecting the causes of the more active forms of the disease. When chronic inflammations supervene primarily, they generally spring from the sources already pointed out, and are more frequently met with in the nervous and melancholic temperaments, and as a sequela of long-continued disorder of the digestive organs, particularly of the stomach and large intestines. They are also frequently found as a consequence of more active disease, and of organic changes produced in some part of the biliary apparatus. Morbid states of the functions

of the liver, and of the constitution of the bile itself, owing to the continued irritation thereby kept up, are also conducive to slow inflammatory action in the substance of the organ; chronic inflammations frequently thus originating, as the more active inflammations often do, in functional derangements, and in congestions of the viscus. Indeed, on many occasions, such derangements not only introduce the inflammatory state, but also accompany it in a more or less marked manner during its progress, and even often continue for some time after its decline.

Those cases of hepatitis which differ from the more acute forms of the disease merely in degree, becoming on this account only more chronic or slow than those we have already detailed, require no further illustration. They seldom terminate otherwise than favourably, when treated with judgment and decision; and when they end unfavourably, it is generally by inducing organic change, either in the biliary organs or in the large bowels, owing to the morbid condition of the biliary and intestinal secretions, as shewn in the subjoined details. The following Cases will further illustrate our views respecting many of the more chronic diseases of the biliary organs generally met with in India.

CASE LXIII.—*Chronic Inflammation of the Liver, with Congestion and Secretion of morbid Bile; Inflammation of the small and large Intestines supervening, and terminating the Life of the Patient.—Examination post Mortem. (See Plate X.)*

WILLIAM MAC LAUREN, aged 35, was admitted while encamped at Kurnool, 19th October. Is a debilitated man, from long residence in India, and from drinking the intoxicating liquors of the country. Had, a few months since, an attack of chronic hepatitis, with disorder of the bowels, from which he apparently recovered. Has been again complaining for some time of hepatic symptoms, and has now purging; passes blood by stool: great sickness at stomach, and bitter taste in his mouth; tongue foul.—Habeat haust. emet.

Vespere.—He vomited a lumbricus; considerable debility.—R Aquæ ammon. ℥xx.; spirit. lavand. compos. ʒij.; aquæ puræ, ʒjss. Ft. haust. stat. sumend. Habeat hydrarg. submur. gr. xij. h. s.

20th.—Pulse 80, and good; tongue foul and yellow; great thirst; stools bloody,

mixed with mucus, and some fæces.—Habeat ol. ricini, ℥ij. Injiciatur enema purg. statim. Habeat mist. salin. ℥ij. secundâ quâque horâ.

Vespere.—Pulse 90, more languid; tongue foul; thirst urgent; stools the same as in the morning.—Cont. mist. salin. Adhibeat scrob. cord. emplast. lyttæ. R Hydr. submur. gr. xij.; pulv. antim. gr. iij.; opii, gr. ij.; syr. q. s. Ft. pilul. h. s. s. Injiciatur enema emolliens.

21st.—Pulse the same as at last visit; tongue still foul; stools bloody.—R Ol. ricini, ℥jss.; aquæ menth. pip. ℥ij. Ft. haust. stat. sum. Injiciatur enema. cum ipecac.

Vespere.—Pulse 108; skin very moist; tongue foul and dry; stools watery, bloody, and mucous; great flatulence; no pain of the belly when pressed.—R Hydr. submur. ʒj.; opii, gr. ij.; syr. q. s. Ft. pilul. h. s. s. Injiciatur enema emolliens.

22d.—Pulse 98, much weaker; skin agreeably moist; tongue still foul; stools liquid and bloody; some griping pain in the night; great prostration of strength.—Injiciatur enema emolliens. R Acid. nitros. ℥ij.; tinct. opii, ʒiij.; aquæ puræ, ℔ij. Fiat potus, cujus cyathum horis singulis sumat.

Vespere.—Pulse frequent, and very feeble; tongue furred; thirst urgent; stools unaltered; tenesmus less severe; no pain.—Contin. pot. acid. heri præscriptus. Injiciatur enema, cum ipecac. Habeat haust. anodyn. h. s. Bibat infus. tamarind.

23d.—He has been very uneasy during the night, and has vomited a great deal; pulse imperceptible; skin cold, and exhaling an unpleasant odour; stools watery and bloody; no pain; he appears to be moribund.—R Tinct. opii, ℥xl.; spirit. æther. sulphur., aquæ ammon. utriusque, ℥xx.; aquæ puræ, ℥ij. Ft. haust. stat. sumend.

Vespere.—No improvement of the symptoms.—Cont. med.

24th.—The body exhales a strong cadaverous smell, and all the symptoms are worse.—Ponantur juxta lectum aceti acetabula vaporantis. He died at one o'clock.

Examination, two hours after Death.—The liver was much enlarged, and of a blackish brown colour externally, and its right lobe rose high into the right thorax, and was of a spheroid form. Upon being divided, its vessels were greatly congested with blood, and its ducts with thick, dark-coloured, viscid bile. The internal structure of the liver was more than usually vascular, of a dark brick colour, and more condensed and more friable in its texture than natural. The gall-bladder contained some green-coloured bile. The ducts were unobstructed. The small and large intestines were inflamed throughout, and so much softened in their texture, and so easily lacerated, that the ilium and colon tore upon removing them for inspection. The mucous coat was detached from the subjacent texture in many places of the colon, and in others it was sphacelated. The other organs presented no marked derangement.

Remarks. — We did not see this case until symptoms of gangrene of the bowels had supervened; otherwise, notwithstanding the circumstance of the worn-out system of the patient, and his inordinate addiction to spirits, depletions would have been practised. The time for their employment soon passed off; and after the 21st, his case admitted of no hopes from any treatment. The liver presented an appearance of disease very frequently met with as a consequence of chronic inflammations of the organ, (see Plate X.); and on that account the case is inserted in this place.

CASE LXIV.—*Chronic Inflammation of the Liver.—Recovery.*

ROBERT CLARK, ætat. 22, admitted 4th May at Hydrabad, after a very fatiguing march. He has suffered a good deal for several months past with chronic inflammation of the liver, which was treated by leeches, purgatives, and mercurials. He now complains of a severe pain under the clavicle, extending to the liver: he has no pain on pressure, but feels a sense of heat in the side; pulse very small, and languid; tongue white and excited. — Apply a large blister to the side; and give the pilul. hydr. cum calom. nocte maneque.

5th. — The blister has not risen; he feels no material change; he was purged a good deal, and feels the heat he complained of much less; pulse regular, 72. — Cont. pilul. ut antea. Haust. amar. cum sennâ, ʒij. nocte maneque.

Evening. — The blister has risen well, but he still feels the pain under the fifth rib; stools watery. — Cont. pilul. et haust. Apply twenty leeches to the side where he feels pain.

6th. — Found great relief from the leeches; he is much easier this morning; tongue still excited; pulse weak, but this appears to be his natural pulse. — Cont. pilul. et haust. ut antea; rub in over the side, ʒj. unguent. mercur. nocte maneque.

7th. — Tongue still foul and clammy; has some pain in the shoulder, but no pain in the side; feels much better; stools watery, with some feculent matter. — Cont. ut antea.

Evening. — The pain in his shoulder this evening is severe; but he has no other pain. — Apply eighteen leeches to the base of the shoulder-blade. Cont. omnia.

8th. — The pain in his shoulder is diminished since the leeches were applied; stools much improved in appearance; tongue still excited; feet swell. — Cont. ut antea.

9th. — Good appetite; stools copious and natural; feels much better. — Cont.

11th. — Alvine excretions quite natural, and he is recovering daily; he has no complaint but weakness. — Discontin. pilul. et frictio; cont. haust. amar. cum sennâ,

nocte maneque. R Decoct. cinchon. ℥bj.; acid. vitriol. dilut. mxxx.; aquæ ammon. m℥x. M.; a wine-glassful every four hours. This treatment was continued; he improved daily, and was discharged on the 19th, perfectly recovered.

Remarks.—The great debility and weakness of the pulse at one time made it a matter of doubt whether farther depletion could be ventured upon. Leeches were, however, applied when we found that the pain was not removed by the blister, and, in conjunction with the other means, removed the disease.

CASE LXV.—*Chronic Disease of the Liver, with Signs of previous Abscess, Atrophy, Torpor of the Viscus, and singular Position of the Colon. — Post Mortem Examination.*
(See Plate XIV.)

EDWARD GORMAN, Sergeant-major, aged 45, an old soldier, hard drinker, and many years in India. Has suffered repeated attacks of chronic hepatitis, and has been several months in a state of general ill health, but has not been under medical treatment until his admission into hospital on the 5th of June, with the following symptoms:—The legs are much swelled; tongue foul; bowels constipated. He complains of a confused sensation of pain about the loins; and of general torpor of both the superior and inferior extremities.—Habeat mist. purg. ℥ij. stat. R Massæ pilul. aloë. cum colocynth. ʒj.; hydr. submur. ʒss.; pulv. antimon. gr. x.; syrup. simplicis, q. s. Ft. pilul. xx. quarum duas horâ somni capiat.

6th.—Tongue foul; stools scanty, watery, of an olive-green; the numbness of his limbs continues.—Habeat mist. purg. ℥ij. stat.

Vespere.—Stools scanty, mixed with some small green scybala.—Repet. pilul. heri prescriptæ.

7th.—Stools more natural in colour; soreness of his loins increased; the torpor of the limbs unaltered.—Habeat mist. amar. cum sennâ, ʒij. Repet. pilul. et mist. amar. cum sennâ, h. s.

8th.—No stool; swelling of the legs subsided; pulse good; tongue clean; the numbness in the hands continues, but in the legs it is much diminished; he complains much of general pains.—Hab. mist. purg. ℥ij. Rep. pil. et mist. amar. cum sennâ.

9th.—Stools more feculent; the functions of the limbs are restored; he complains of a painful heat in his bowels.—Habeat mist. purg. ℥ij. stat. Cont. pilul.

10th.—Stools more copious, feculent, and of a darker colour; the torpor is much less, and sensation is gradually returning.—Habeat mist. purg. ℥ij. stat.

Vespere.—Stools greenish, more feculent; much thirst.—Cont. pilul.

11th.—Stools more feculent; the numbness is rapidly decreasing; and pain of

the limbs is becoming more acute. — Repet. mist. purg.; atque mist. amar. cum sennâ, vespere maneque. Cont. pilul. h. s.

12th. — Pulse soft and full; stools scanty, feculent; the torpor of the hands continues; and there is still a degree of the same affection in the legs; he is languid, and indisposed to return answers. — Cont. mist. amar. cum sennâ. Habeat vini cyathos duos in die. Cont. pilul. h. s.

13th. — Stools hardened and figured. — Cont. mist. amar. cum sennâ; pilul. h. s.

14th. — Stools more feculent and more copious. — R Hydr. submur. gr. v.; pulv. jalap. ʒj. Sit pulvis, quàm primùm sumendus.

15th. — Numbness is abating, and pain in the extremities increasing. — Cont. mist. amar. cum sennâ.

16th. — Stools more feculent, and of a green colour; pains more severe in the limbs; the numbness is less general. — Cont. mist. amar. cum sennâ.

17th. — No alteration. — R Hydrarg. submur. gr. v.; pulv. jalap. ʒj. Sit pulvis, statim sumendus.

Vespere. — The powder not having operated was repeated, and produced copious, liquid, and fetid evacuations. — R Hydrarg. submur. gr. xij.; pulv. antim. gr. iij.; syr. simp. q. s. Fiat. pilul. horâ somni sumend.

18th. — No change. — R Infus. sennæ, ʒvj.; tinct. sennæ, ʒss.; sodæ sulph. ʒj.; tamarind. pulp. ʒj. Fiat mist. cujus unciaë duæ omni horâ sumend. donec plenè soluta fuerit alvus. Repet. horâ somni, pilul. heri præscripta.

19th. — Stools more copious, of a yellow colour, with some dark-brown matter on the surface; pains unaltered; confusion of intellect. — Repet. mist. heri præscripta. Repet. pilul. horâ somni.

20th. — He complains of griping and general uneasiness. — Habeat pulv. purg.

Vespere. — Stools quite feculent, and of a dark olive-green colour; no material change. — Repet. pilul.

21st. — He continues the same. — Habeat pulv. purg. Injiciatur enema purg. Adhibeatur nuchæ emplastrum lyttæ.

22d. — The blistered surface has risen very well; pulse continues the same; he appears to labour under general anxiety and uneasiness; and his mind is evidently much impaired. — R Ammon. subcarb. gr. vj.; confect. aromat. gr. x. Fiat bolus, quàm primùm sumend. Habeat vini cyathum.

Vespere. — Breathing stertorous and very laborious; pulse soft and slow; belly much swelled; stools pass involuntarily; he is quite insensible. — R Mist. camph. ʒvj.; aq. ammon. ʒiij. Fiat mist. cujus unciam, secundâ quâque horâ, capiat. Adhibeatur suris emplastrum lyttæ. He died at eight o'clock.

Examination.—A considerable quantity of lymph was suffused over the brain, which was preternaturally soft, and of an unusually pale colour. About three ounces of fluid were found in the lateral ventricles, and a considerable quantity was also found in the fourth ventricle. The vessels of the cerebellum were filled with blood. On opening the abdomen and thorax, the whole abdominal viscera were found inflated. The liver was of a very pale colour and extremely small size; and on its surface there was a large fissure, that marked the situation of a former abscess. The structure, about the part, was changed into a kind of cartilage. The internal constitution of the liver was otherwise natural. When divided in the situation of the cicatrix, the cicatrization of the substance of the organ was evident through the greater part of its thickness.* Some constrictions were observed in the small intestines; but those viscera were in general healthy. There was no ulceration in the large intestines; but the colon, after following its usual course, and after it had passed under the stomach and the liver, and had passed downwards on the left side some way, took a direction towards the spine, and crossed it as far as about three inches on the right side. It then descended parallel to the spine, till it reached the right ilium, when it took a direction backward to the left ilium, and descended into the pelvis, almost to its bottom: it then took another turn upwards as high as the os sacrum, and at last descended into the left ilium in the natural manner. The stomach was very pale, but not diseased. The other viscera were natural.

Remarks.—That abscess of the liver had formerly existed in this case was very manifest, both from the previous illness of the patient, and the state of the organ discovered on examination after death. The singular irregularity in the course of the colon deserves attention. We shall have occasion to mention various deviations from the usual position of this viscus in the course of the work, some of them apparently the consequence of disease, others evidently of original conformation.

CASE LXVI.—*Chronic Inflammation of the Liver, very acute Inflammation and Gangrene supervening in the Bowels, with much Enlargement, softening, and blanching of the Texture of the Liver, and ex-sanguinated State of its Vessels,—a State nearly approaching to Gangrene.*—(See Plate XIII.)

TIMOTHY DONOVAN, æt. 30; has been in India about ten months; is a fair-complexioned man, of the sanguine temperament, and addicted to drunkenness: has been ill for some considerable time, and, according to the account he gives of himself, has been suffering

* See Plate XIV. Fig. 1 and 2.

under slow inflammation of the liver, but has neglected himself, and was not brought under our care until the 21st. His tongue is foul, with a deep yellow crust, but it is moist; pulse good; skin moist and warm; says he has no pain in his belly, but the motions are morbid and feculent.—R Calom. gr. xij.; pulv. antim. gr. jv.; syr. q. s. Ft. pilul. h. s. s.

22d.—Pulse 64; motions extremely morbid and crude, of a pale yellow colour; no pain.—Haust. amar. cum sennâ, ʒij. nocte maneque; pilul. hydrarg. cum pulv. antim. no. 1. three times a day. These medicines were continued with apparent good effect till the evening of the 23d, when he complained of griping pains in his belly; stools of a pale straw colour; pulse 60 in a minute.—Repet. pilul. calom. gr. xij. ut antea.

24th.—Pulse 62; much easier; stools very copious, crude, and feculent.—Ol. ricini, ʒij. stat.

Evening.—Stools extremely copious, morbid, and feculent; tongue cleaner; feels pain at the pubis when he makes water.—Apply fomentations to the belly, and twelve leeches to the pubis. Repet. pilul. calom. gr. xij. h. s. s.

25th.—Leeches relieved the pain, and he passed his urine well afterwards; his stools are watery, with the appearance of blood, and some fæces floating on the surface, of a green colour; skin dry and rather hot; tongue cleaner.—Pilul. hydr. cum ipecac. no. 1. ter in die; haust. amar. cum sennâ, ʒij. nocte maneque. Sponge his body with vinegar and water, and give sago diet.

26th.—Stools very offensive and feculent, no blood; complains of pain at the umbilicus on pressure; he vomited some bile, and was much relieved; pulse 74; skin dry; a bitter taste in his mouth.—Apply sixteen leeches to the umbilicus, and give an ipecacuanha emetic.

Evening.—He has brought up a great deal of viscid, green bile, and he is considerably relieved by it; pulse is soft and full, 96; stools bloody, but no straining, and he has no pain in passing water.—Repet. pilul. calom. et haust. anodyn. h. s. s.

27th.—Stools copious, bloody, watery to appearance, but mixed with fæces when closely examined; says he is better; tongue not at all furred; pulse 76.—Enema ipecac. stat. Ol. ricini, ʒij. stat., which operated very well, and brought off a great deal of feculent matter, of a green colour, and granulated; no pain; pulse the same.—Repet. enema. Repet. pilul. hydrarg. cum ipecac. ut antea. Haust. anodyn. h. s. .

28th.—Pulse 76; stools copious and watery, with the appearance of dissolved fæces; he has no pain; tongue natural; a gentle warm moisture on the skin.—Repet. ol. ricini. Adhib. enema. Adhib. pilul. ut antea.

Evening. — Stools frothy, of a green and yellow colour, mucus, very little feculent matter; had some griping. — Cont. ut antea.

29th. — Pulse 84, strong, and hard; feels pain under the right hypochondrium, which came on at two o'clock this morning, and has continued ever since; he cannot bear pressure on the region of the liver. — Apply sixteen leeches immediately. Mist. salin. febrif. ℥ij. every two hours. Ol. ricini, ℥j.

Evening. — The leeches bled well, but the pain continues; his stools are green and bilious; tongue foul; pulse 88; no tension or fulness in the belly. — Repeat eighteen leeches to the side immediately. Enema purg.; haust. anodyn. h. s. s.

30th. — Pulse strong and full, 78 in a minute; skin warm; the enema procured him very large motions; has passed a great deal of feculent, acrid matter, and a considerable quantity of bloody water afterwards; tongue foul and dry; he has no pain this morning on pressure, and he passed his water very well, after the leeches had bled freely; has considerable thirst. — R Mist. salin. febrif. ℔j.; vin. antim. ℥ss.; spirit. æther. nitros. ℥jv.; a glassful every hour. Repet. enema ipecac.; cont. pilul.; sago diet.

Evening. — A great deal of feculent matter, with some bloody water; tongue dry and furred; pulse strong and full; has considerable pain over the belly; skin hot and dry. — Apply eighteen leeches over the belly; enema purg. Repet. mist. salin. febrif. ut antea. Calom. gr. xx.; opii, gr. ij. Ft. pilul. h. s.

31st. — Pulse 84, full, and strong; he complains very much of pain in his bowels; tongue foul, and covered with clammy mucus: there is no fulness or tension in his belly, on examination, as might be expected from the pain he complains of; but there is evidently great irritation and mischief going on in his liver and bowels. — Mist. purg. ℥ij. immediately, and to be repeated till fully purged; after which give enema anodyn. cum opio puro, gr. jv.; mucil. seminis lini, ℥jv. ft. enem. R Mist. camp. ℥j.; spirit. æther. nitros. ℥xxx.; tinct. opii, ℥xxx. M. ft. haustus; to be taken every three hours.

Evening. — Pulse 92; has no pain or oppression; tongue dry and furred; vomited some bile; skin more natural. — Repet. enema, et haust.; pulv. Doveri, gr. xv. h. s. s.

January 1st. — Perspired a good deal in the night; was not at all sick; tongue as before; has some pain when he goes to stool, and there is blood mixed with them, but not that dark grumous blood which is usual in cases where ulceration has taken place; has no pain on pressure being made on the belly, but there is fulness and soreness. — Apply a large blister over the belly. Pilul. ipecac. cum opio, no. 1. ter in die. Repet. enema; cont. haust.; and put him into a tepid bath.

Evening. — Blister exceedingly painful; otherwise the same. — Cont.

2d. — Pulse small and weak, 98 in a minute; tongue dry, and covered with a yellow fur; the blister is very painful, and he does not feel the soreness over the abdomen; his countenance is much changed, and he appears to be sinking. From this time he got worse hourly; cold clammy perspirations broke out over his skin; and he died on the 3d of January, 1817.

Examination, three hours after Death. — The liver was considerably enlarged, and pressed so completely under the diaphragm, that there was very little of it visible; it was softer than natural, and of a kind of pink colour, with white vessels spread over the surface. (See Plate XIII.) When divided, it presented even a paler colour than that of the surface, and was much softened in its internal structure. Its vessels seemed deficient in blood. The stomach appeared much lengthened, and extended completely across from the left, to the right hypochondriac region. The colon was much inflated, and completely enveloped in the omentum, and of a deep greenish colour. The small intestines were exceedingly inflated; but portions of the ilium were contracted to the size of a goose-quill, and very highly inflamed, as was a very great proportion of the ilium; and near the cæcum, ulcers had made way through the gut: the contractions were partial. The colon was also constricted by bands throughout, and covered with bright purple spots, from ulcerations within. The internal surface of the colon, from the cæcum to the rectum, was ulcerated, and of a black colour; and there was a gristly hardness about the rectum.

Remarks. — When this case came under treatment, it presented many of the symptoms of congestion, with a morbid state of the biliary secretion and of the function of the bowels. The exasperation of the symptoms, which occurred on the 29th, was both sudden and most acute, and probably was not met with sufficiently large depletions. He lost, however, on that and the following day, between sixty and seventy ounces of blood locally. The sudden cessation of pain, and the other symptoms complained of, on the evening visit of the 31st, and on the 1st of January, seemed to point out the supervention of gangrene, which certainly the appearance of the bowels indicated; and the state of the liver, observed on dissection, more nearly approached that condition than any other appearance of this viscus that we have yet observed, excepting that remarked in a subsequent case. And yet we cannot consider the liver in these instances as at all gangrenous; although, had a longer time been allowed to elapse from the time of death to that of dissection, this state might have been more fully developed. The Plate will shew the colour and external appearance of the organ.

CASE LXVII.—*Atrophy, with Organic Change of the Liver.—Examination, &c.*

J. SANGOWITCH, admitted in the evening of the 12th of June. His constitution has been worn out, from a long residence in the country, and addiction to intoxicating liquors. Has been drinking, although he is suffering from long-continued disease, seemingly of the mesentery and liver. He complains of violent pain in his belly, which is drawn remarkably close to the spine.—Apply a blister to his belly. Haust. anodyn. h. s.

13th.—Stools green and feculent; pulse languid; (medicine cannot be of any use to him.)—Mist. amar. cum sennâ, ℥ij.; aquæ ammon. ℥xx.; to be taken three times a day. Punch, three glasses.

Evening.—No material change.—Cont. mist.

14th.—Lingering; he is no better; his stools are feculent and natural.—Three glasses of wine. Cont. mist.

Evening.—Much better; pulse much improved.—Cont. mist.

15th.—Cont. haust. amar. ut antea, cum tinct. ferri muriat. ℥xij. to each dose. Haust. anodyn. h. s.

The symptoms and treatment were nearly as above until the 28th of the following month, when abdominal dropsy supervened.

30th.—Belly full and swelled; has had stools, but they are scanty.—Pulv. purg.

Evening.—Much oppressed; he appears to be sinking.

31st.—Died.

Sectio Cadaveris, three hours after Death.—About three or four gallons of water were found in the abdomen, which had accumulated in two days, and a small quantity of water in the chest. The small intestines were white, soft, pulpy, and contracted. The stomach was contracted to an extraordinary degree, and had the appearance of part of the duodenum. The colon and cæcum were of a pale blue, leuco-phlegmatic appearance. Liver very small, hard, and rough, like a boiled mass, and covered with various scars. Lungs blue, and inflated. Heart soft, pale, and surrounded by a small quantity of water in the pericardium.

CASE LXVIII.—*Atrophy and Organic Change of the Liver, with Dropsy, enlarged Spleen, and Peritonitis.—Examination post Mortem.*

JOHN TASKER, aged 48, a Poonamallee pensioner, an old residenter in the climate, and addicted to the use of the pernicious liquors of the country, was admitted, March 14th,

with dropsy. Belly amazingly enlarged; lower extremities considerably swelled; urine scanty, by account pretty regular. Complaint of seven months' standing; and he has been tapped thirteen times during that period. Pulse at present small and frequent; skin of the natural heat; and his tongue is clean, but rather furred; no particular thirst; appetite good.—Sumat statim pulv. jalap. ʒj.

Vespere.—Purged frequently; stools light-coloured; urine very scanty; abdomen extremely enlarged; perspiration hurried.—R Acetat. potass. ʒj.; aquæ puræ, ʒij.; spirit. lavand. comp. ʒss. M.; ft. haust. ter de die.

Ten at Night.—Much oppressed, and very restless; passed no urine since last report; thirst urgent; tongue moist and clean, but perfectly white; countenance very sallow; skin cool, with a profuse perspiration over it; pulse extremely feeble.—Repet. haust. anodyn. stat. R Decoct. amygdal. ℥ij.; spirit. æther. nitros. ʒss. Ft. potus ad libitum.

15th.—Passed about a pound of urine in the night; swelling of abdomen very considerable; pulse small, and 80 in the minute; tongue of a white appearance, as before; short dry cough; respiration hurried and oppressed; skin cool and moist; thirst less urgent; appetite much impaired; œdematous swellings of the feet.—Cont. potus et medicina ut olim. Light diet.

Vespere.—Passed four ounces of urine only since morning, and he is extremely uneasy and restless; dyspnœa difficult; pulse pretty firm; skin cool; purged several times during the day; lower extremities much swelled.—The operation of tapping was performed, and eleven quarts of fluid drawn off. A cardiac and diuretic mixture was ordered; and the treatment already prescribed was continued, without material change, until the 17th, when he complained of a scalding sensation all over the abdomen; and was extremely restless and feeble, with dyspnœa, and cold skin with cold clammy perspiration. He died the following night.

Examination, seven hours after Death.—The body extremely emaciated; belly of a prodigious size. On removing the parietes abdominis, no vestige of the omentum could be seen. The large and small intestines were inflated to an enormous size, and of a peculiarly dark colour, general inflammation having taken place in the alimentary canal. The colon contained some feculent matter of a clayey appearance. The stomach was much inflated; and, on its being pressed up towards the diaphragm, a quantity (℥ij.) of green watery fluid oozed out from the mouth and nostrils. About three quarts of fluid were contained in the cavity of the abdomen, and a considerable quantity of coagulable lymph in the pelvis. The mesentery and meso-colon were of a translucent appearance; mesenteric glands healthy. General inflammation

of the peritoneum had supervened. The liver much indurated, and granulated throughout its whole substance, and smaller than natural. The gall-bladder of its usual size, and full of bile. The spleen greatly enlarged, and weighed one pound and three quarters. Kidneys natural. Bladder somewhat contracted, and contained no urine. The heart appeared natural, with the usual quantity of fluid in the pericardium. Lungs were perfectly natural, with the exception of adhesions to the pleura costalis, and more water collected in the cavities of the chest than usual.

Remarks.—The appearances on dissection fully accounted for the scalding sensation felt in the abdomen a short time before death.

CASE LXIX. — *Chronic Disease of the Liver, complicated with organic Change and with Dysentery.* — *Dissection.* — (See Plate XVI.)

JAMES CAVANNAH, ætat. 34, has been in India about three years; was employed in Europe as a bricklayer's labourer, and had been very much in the habit of dram-drinking; has not been in hospital but once since he joined the regiment, and that was for a venereal complaint; but he appears to be a man of a broken constitution. Admitted into hospital the 16th September, 1816, on the march (in the Mysore country) complaining of pain in his bowels, sickness at stomach, and great irritability; has a peculiar white appearance of the tongue, but it is moist; skin not unusually warm; pulse 96, strong and full; complains very much of violent pain in the lower part of his belly and about the anus, with some straining. — Habeat submur. hydrargyri, gr. xx. h. s.

17th. — No material alteration of any kind; was not purged in the night. — Mist. purg. ℥ij. stat. sumend. Repet. pilul. submur. hydrarg. gr. xx. h. s. ut antea.

18th. — Feels much better this morning in every respect; fully purged; stools crude, morbid, but feculent; tongue cleaner; mouth slightly affected; pain about the anus less. — R Infus. amar. ℥j.; infus. sennæ, ℥ss.; tinct. cardam. ℥ss. M. ft. haust. horâ somni sumend.

19th. — Looks much clearer and better this morning; but he complains of pain in his head and in his belly, with some uneasiness on pressure; pulse not accelerated; tongue clean. — Apply a blister to each temple, and one to the belly.

20th. — Much relieved in every respect, and thinks himself quite well this morning. — Repet. haust. amar. cum sennâ, ut antea. Habeat pilul. calom. gr. xij. h. s. Mist. purg. ℥ij. cras mane.

21st. — Was purged by the mixture; evacuations of a natural appearance, but he

has had fever the whole of this morning; pulse quick and full; skin moist; no pain; tongue clean and moist. — Habeat pilul. calom. gr. xx. h. s.

22d. — Much better this morning; fever has completely left him. — Sumat stat. ol. ricini, ℥ij. etiam injicietur enema purgan. Haust. anodyn.

23d. — Improving daily; evacuations natural. — No medicine. Sago and wine for dinner and supper; sugee and milk for breakfast.

24th and 25th. — No complaint but sore mouth and weakness. — Habeat infus. amar. comp. ℥jss. bis in die.

26th. — Alvine discharges perfectly natural; but a small quantity of blood has been passed after slight straining; no pains. — R Infus. amar. comp. ℥j.; infus. sennæ, ℥ss.; tinct. sennæ, ℥ij. M. ft. haust. statim sumend. et repet. si opus sit.

27th. — Stools pure blood this morning; no fæces; very little tenesmus; but has frequent inclination to relieve himself, without the power. — Sumat statim ol. ricini, ℥ij.; et injicietur enema emolliens, etiam foveatur regio abdominis.

Evening. — Has passed some fæces, and feels better, but still passes blood in considerable quantity; pulse 84; mouth tender; tongue clean. — Habeat pilul. calom. gr. xx. h. s., et repet. enema emolliens.

28th. — Feels infinitely better this morning; was not purged in the night. — Sumat statim mist. purg. ℥ij. et habeat enema purg. Repet. enema emolliens et calom. h. s.

29th. — Passed his stools with more ease, but they are still mixed with blood; he thinks himself better; pulse 82 in a minute. — Repet. mist. purg. et enema, ut antea.

Evening. — Stools copious and feculent; very little blood; no pain or straining. — Repet. pilul. cal. gr. xij. Haust. anodyn. h. s. s.

30th. — Passed an excellent night, and is much better. — Sumat stat. pulv. purg.

Evening. — Fully purged; stools feculent; no blood. — Repet. pilul. calom. et enema, ut antea.

October 1st. — Thinks himself better this morning; has not had any stool in the night. — Habeat haust. amar. cum sennâ, ℥j. stat.

Evening. — No straining; evacuations natural, with a small quantity of blood, but perfectly distinct from the fæces; tongue rather furred. — R Calom. gr. xij.; pulv. antim. gr. iv.; syr. q. s. Ft. pilul. horâ somni sumend.

2d. — Felt a good deal of sickness in the night from the pill; but is better this morning; stools perfectly natural, but with some blood quite distinct and pure. — Habeat ol. ricini, ℥j. statim.

Evening. — Better this evening; has not passed any blood; the oil has operated well. — Haust. amar. cum sennâ, ℥j. horâ somni sumend.

3d. — Feels greatly better this morning; has had two perfectly natural evacuations, without any straining or blood. — Repet. haust. amar. cum sennâ.

These medicines were continued till the 7th, when he felt himself quite well, and was discharged, but took the infusion of senna, &c. occasionally, to keep his bowels regular. He continued tolerably well till the 15th, in the evening, when he again complained of passing blood in his stools, which were quite natural, and with very little straining; but his countenance was expressive of uneasiness, which he could not describe, and we took him again into hospital. There was something in his pulse that indicated disease; it was considerably accelerated, which we imputed to his having taken arrack or some pernicious beverage sold in the bazar, which had, in our opinion, occasioned fatal dysentery in two or three men, complicated with diseased liver. Twelve grains of calomel were given to him at bed-time, and a flannel bandage was applied round his belly. He had two natural stools in the night, without any blood, and felt much better in the morning. — R Pilul. hydrarg. ʒss.; calom. gr. xij.; opii purif. gr. vj.; syr. q. s. Ft. pilul. vj. Capiat unam bis in die.

16th. — Has less pain in his bowels, and no straining at all; evacuations natural; pulse about 90, soft and full. — Cont. pilul. suprâ præscripta; etiam infus. amar. cum sennâ, ʒj. nocte maneque.

17th. — No material change since yesterday, except that he feels a cold sensation in his belly, which he has never felt before, and he is exceedingly uncomfortable from it. — Repet. med.

Evening. — Alvine evacuations perfectly natural and formed; no straining or pain, but he feels a weight at the lower part of his belly. — Habeat calom. gr. xij. h. s. Cont. pilul. et haust. amar. ut antea.

18th. — Complains again of the cold sensation in his belly, and his stools this morning have a morbid appearance, with feculent matter; and lumps of hardened fæces have been passed, but no blood; tongue clean. — Habeat ol. ricini, ʒj. stat., et enema purg. Repet. pilul. ut antea.

Evening. — Passed nothing in his stools but glairy mucus, with pieces of bilious matter, of a green colour; feels very weak, but does not complain of pain. — Imponatur emplast. canthar. ampl. circa umbilicum. Habeat calom. gr. xij. formâ pilul., etiam enema purgans.

19th. — Feels much better this morning; stools more natural in appearance, but lax; the blister has done its duty, and he thinks himself better for it. — Sumat haust. ex infus. amar. ʒj.; infus. sennæ, ʒss.; tinct. cardam. ʒss.; aquæ ammon. ℥xxx. M. statim sum.

Evening.—Alvine evacuations this evening gelatinous matter mixed with fæces; feels very weak; passed no blood; pulse quick, 96 in a minute.—Detur enema cum decoct. rad. ipecac. R Pulv. ipecac. gr. vj.; opii puri, gr. j.; syr. q. s. ft. pilul. quartis horis sumendæ.*

20th.—Has found great ease from the enema; his tongue is clean; stools watery, with mucus and undigested vegetables; does not complain of any pain.—Cont. pilul. et enema, ut antea.

Evening.—Stools crude and morbid, rather consistent, but not marked with bile, or at all natural; felt drowsy all day; tongue rather furred; pulse natural and soft; no straining at all.—Habeat pilul. calom. gr. xij. h. s. Repet. pilul. et enema ipecac. ut antea.

21st.—Skin moist; stools feculent, natural consistence, and well marked with bile; was griped in the night, and frequently purged; tongue the same.—R Pilul. hydrarg. ʒj.; calom. ʒj.; pulv. antim. ʒss.; syr. q. s. Ft. pilul. xx.; capiat j. nocte maneque. Repet. pilul. et enema ipecac. ut antea.

Evening.—His bowels were moved only by the enema; he feels sickness at stomach, which, we suppose, is occasioned by the pills, &c. &c.; pulse good, but he complains of general uneasiness.—Cont. ut antea.

22d.—Passed a tolerable good night, and is now in a full, free perspiration; feels much easier; was not purged in the night; pulse strong and good.—No pain in his belly.—Cont. omnia.

23d.—Stools this morning perfectly natural, but there is a considerable quantity of red florid blood with them, perfectly unmixed with the stools, as if some vessel had given way; felt a good deal of griping in the night, which was relieved after the discharge of these stools; to use his own words, he says, “that he felt a ball forming before the stools were passed, which was dissipated the instant his bowels were emptied.” His mouth is rather sore; tongue foul; pulse full, but does not indicate inflammation.—Sumat stat. ol. ricini, ʒij.; ex aquâ menth. ʒij. Cont. med.

24th.—Feels easier this morning; stools of a bright orange colour, and natural.—Cont. omnia.

25th.—Skin moist; tongue foul; stools natural; feels a giddiness when he moves; has no sickness at stomach.—Cont. omnia.

* Our view in giving these pills and enema is to produce nausea, general relaxation, and to allay spasm; as we conceive, from the discharges of mucus, mixed with small pieces of fæces, that much disorder arises from some constriction in the alimentary canal, but cannot be sure whether it be in the small or great intestines: most probably in the latter.

26th. — Pulse 77 in a minute; skin warm and moist; stools watery, but of a natural colour; says that he feels stoppage in making water; tongue rather foul. — *Injicietur stat. enema anodyn. et foveatur pubes. Cont. med. Repet. enema et foment. h. s.*

27th. — Makes water quite freely; has not had any stool in the night; tongue continues foul, and he feels thirsty. — *Acid. veget. pro potu ordinario. Repet. med. omnia, ut antea.*

28th. — Pulse very regular, and only 84 in a minute; was vomited and purged a good deal in the night; tongue yellow, and furred in the centre; has a very bitter taste in his mouth, and says he feels great relief from vomiting; complains of very considerable pain about the umbilicus generally, and there is a hardness to be felt in the transverse arch of the colon, with some pains, but he has no pain whatever in the seat of the liver, nor has he felt any from the time he came into the hospital till now. — *App. hirud. xiv. circa umbilicum. Sumat haust. emet. stat. Omit. med. alia.*

Evening. — Discharged from his stomach a considerable quantity of green bitter fluid, which has relieved his stomach considerably, and his tongue is much cleaner; the leeches have bled well, and he is much better. — *Sumat haust. anodyn. cum tinct. opii, ℥xl.; aquæ ammon. ℥xxx.; spirit. æther. nitros. ʒj.; aquæ puræ, ʒij. M.*

29th. — Passed a tolerable good night, but towards day-light he was attacked with purging and pain in his stomach; pulse 96 in a minute; perspires more profusely than we have ever seen him, and more so than we wish to see; feels extremely weak and languid; stools smooth, of a pale brown colour; the pain is confined to the course of the colon, but we fear his liver is affected, although he has no pain, even on pressure. — *Imponatur emplast. canthar. ampl. parti affectæ. R Acid. nitros. ʒjss.; aquæ puræ, ℥ij. M. ft. mist. Capiat cyath. vin. tertiâ quâque horâ. Cont. pilul. calom. ut antea. Sed omit. pilul. et enema ipecac. Haust. anodyn. h. s.*

30th. — Pulse small and frequent; skin moist; tongue foul and rough; the pain is much relieved; he only feels the blister; no stool in the night. — *Repet. med. omnia.*

31st. — Was very much purged in the night; perspiration too profuse, neither cold nor clammy; pulse very weak this morning; felt the dampness of the night very unpleasant, and imputes the change to that cause; tongue moist, brown in the centre; stools watery, with some pure blood.* — *Cont. med. omnia.*

* We have been in tents the whole of this month, and came into the fort of Kurnool this evening. The tents were as well shut up as possible; but the dews were very heavy, and their bad effects much felt.

November 1st.—Pulse small and frequent; tongue foul in the centre; pain in the course of the day; the hardness is quite removed; he is still griped, and passes pure blood; does not sweat so much; complains of formications, but no shivering.—Cont. pilul. et acid. nitros. Injiciatur enema anodyn. statim, et h. s. repet.

2d.—Passed a very disturbed night; was a good deal griped; belly less sore and painful; passed pure blood and some glairy mucus by stool; pulse 84; skin covered with a cold, clammy sweat; tongue moist, foul in the centre; thirst urgent; the blister discharges freely; no pain in the right hypochondrium on pressure; pain on pressure in the right ilium, particularly about the cæcum; there is evidently great disease in the liver and large intestines.—Cont. med. omnia.

3d.—Stools bloody, and resemble the washings of raw meat, with masses of blood, no fæces; pulse 98, and irregular; tongue cleaner; less pain in the belly, except when he is at stool; feels relief from the injections; there has evidently some great change taken place, and, from his general appearance, not much aid is to be expected from medicine.—Detur enema decoct. ipecac. bis in die. Cont. pilul.

4th.—Has no pain; is restless, uneasy, and feeble; sleeps very little, in consequence of calls to stool; stools as yesterday; his body exhales a cadaverous smell; aliment and medicine have been unavailing for several days. He continued in this state, daily getting worse, till the 6th, when the stomach becoming irritable, rejected every thing, and he died on the morning of the 7th of November. His diet was particularly attended to throughout his illness.

Appearance on Examination, five hours after Death.—On laying open the thoracic and abdominal cavities, the liver was found enlarged, and studded with numerous white circular spots, about six lines in diameter, which, on being divided, were found to consist of spongy, fungous matter, some having a striated, and others a radiated appearance, and scarcely filling the cavities in the structure of the liver which contained them (see Plate XVI.) These spongy tubercles were disseminated throughout the whole substance of the liver. The gall-bladder was full of light-green bile. The stomach was much inflated, and of a paler colour than usual. The vessels of the omentum were full of blood, and the omentum itself was of an unusually fat, gelatinous appearance, and was firmly attached to the intestines and pubes by previous inflammation.

On removing the omentum, the whole intestines were of a sea-green colour, and had no appearance of red inflammation; but when we attempted to remove the small intestines, to examine the cæcum, colon, and rectum, we were surprised to find a part of the intestinum ilium completely out of its place, and deeply sunk in the

pelvis, between the rectum and bladder. On removing it, we were still more surprised to find a stricture, formed by the ilium, in the shape of a stirrup, in a high state of inflammation, and adhering to the rectum.

The small intestines were generally contracted, and contained a yellow fluid, with something like fæces of a natural appearance.

After removing the small intestines, and exposing the cæcum, colon, and rectum, firm adhesions were observed between the cæcum and ascending colon, and between the sigmoid flexure and the rectum, which, in those parts, particularly at the sigmoid flexure, nearly produced a complete obstruction of the canal of the intestine.

The sigmoid flexure formed a pouch, the villous coat of which was in a gangrenous state. About five or six inches beyond the pouch, two ulcers had perforated the gut through which the contents had escaped into the abdominal cavity.

The mesenteric vessels were full of blood, and most beautifully injected. There were also general adhesions of the whole contents of the abdomen. The thoracic viscera exhibited nothing remarkable.

Remarks.—Although this case belongs to the section on hepatic dysentery, we have inserted it at this place, as it shews one of the forms of organic change of the liver consequent upon slow inflammatory action. Although diseased liver was suspected during the treatment, it was by no means evident. Most probably, the inflammatory state of this organ had subsided before his admission into hospital. The drunken habits of the patient had evidently induced the disease; and these habits, together with the circumstances under which he had been placed during a march, and in tents, had prevented us from resorting to local depletions by leeches so actively as the case required. The relief which was obtained from purging led us also to persist in it longer and more frequently than was perhaps beneficial, to the neglect of vascular depletion.

CASE LXX.—*Atrophy of the Liver from previous Abscess, with Torpor.*—

Examination.—(See Plate XV.)

SERGEANT HENRY HOYTE, admitted into hospital late in the evening of the 30th September, with feverish symptoms and headach. He is a thin man, an old sailor, and has all the appearance of having been a free liver. Complains of sickness of stomach and bitter taste in his mouth.—An emetic was given.

October 1st.—Vomited a good deal of bile; less sickness at stomach; but the pain in his head and feverish symptoms continue.—Mist. purg. stat. et cal. gr. xij. h. s. s.

2d. — Feels better this morning, but has not been purged. — Mist. purgan. ut antea, et repet. pil. calomel. h. s.

3d. — Much better in every respect; tongue this morning quite clean. — Repet. calom. h. s. Ol. ricin. \bar{z} ss. cras primo mane sumend.

4th. — Feels quite well, to use his own words, but his skin is hot. — Mist. salin. febrif. \bar{b} j. ; a wine-glassful every two hours.

5th. — Cont. — 6th. Passed a little blood in his motions this morning, mixed with foul, offensive matter. — Pulv. purgan

Vespere. — Feels some pain about the lower part of his belly, and fulness; motions feculent and mixed with blood. — Apply fourteen leeches to the part pained. Calomel. gr. xx. h. s. s.

7th. — Stools of a dirty black colour and very offensive, mixed with gravelly matter; the pain is removed by the leeches; tongue foul, excited, and white. — Pulv. purgan.

Vespere. — The same dark, black, or brownish-coloured motions; no pain or straining, although he says he passed blood and slime; tongue the same. — Enema ipecac., mist. salin. febrif., et calomel. gr. xx. h. s. s.

8th. — No material change. — Pulv. purgan. stat.

Vespere. — Feels exceedingly weak this evening; stools crude and feculent, with some blood; pulse frequent; skin hot; tongue white and foul; no appetite. — Repet. mist. salin. cum tinct. opii camph. \bar{z} ss. Enema anodyn. at night, and give him sago and wine.

9th. — Feels weak, but in all other respects he thinks himself better; stools more natural; tongue still foul. — Cont. ut supra.

11th. — Tongue continues very foul, and he has a bitter taste in his mouth, and nausea; has no pain in the abdomen; and his motions are natural. — Pulv. ipecac. pro emetico.

Vespere. — Vomited thick yellow bile; feels less sickness; and the bitter taste in his mouth is removed; pulse small and frequent. — Haust. amar. cum sennâ, \bar{z} ij.

12th. — Stools natural; pulse hard and sharp; tongue still foul; headach. — Cont. haust. amar. cum sennâ, and apply fourteen leeches to the temples.

13th. — Much better. — Cont. haust. amar. cum sennâ.

14th. — Stools natural and feculent, but very lax and offensive. — Cont. haust. ut antea, cum tinct. ferri muriat. \bar{m} xv.

Vespere. — Motions a light brown; muddy water; some soreness over the belly. — Apply a blister over the abdomen, and cont. haust. ut antea.

15th. — The blister is very painful, but he has no other pain; and his tongue is cleaner than we have yet seen it; pulse good. — Cont.

16th and 17th. — Thinks himself better, but he does not gain strength; tongue cleaner; but his motions are watery, like mud and gravel mixed; no bile at all mixed with them; appetite improving. — Pilul. hyd. cum calom. no. 1. nocte maneque. Cont. haust. amar. cum sennâ.

18th. — The same. — 19th. Stools more consistent, but still of a very dark colour, and no bile; he thinks himself better; pulse small and frequent, but more the pulse of debility than of inflammation. — Cont. ut antea. R Acid. nitros. ʒij.; tinct. opii, ʒij.; aq. puræ, ℥ij. M. A wine-glassful every two or three hours.

20th. — Pulse this morning small and frequent, with a sharp beat; but it is quite the pulse of irritation; stools more consistent, of the same colour, with some blood, distinct from the stool. — Cont. haust. amar. cum sennâ, ut antea, cum aq. ammon. mxx. add. Repet. pilul. ut antea.

21st. — Motions of a much darker colour, and mixed with undigested matter; he does not gain strength; tongue clean. — Cont.

23d. — No material change; but, on examining his belly, we find it rather hard and tense, *not full*; stools are now perfectly formed and natural, but of a pale colour. — R Decoct. cinchonæ, ℥ij.; tinct. ferri muriat. ʒij. M. ft. mist.; a wine-glassful every three or four hours. R Ung. hyd. ʒss.; camph. ʒj.; ung. alb. ʒj. M. ft. ung. about ʒij. to be rubbed over the belly and side night and morning.

This was continued till the 28th; and although he has not gained strength, he is now certainly better; and his bowels are performing their office very well, though there is no bile mixed with the motions; in the course of the night he was purged a good deal, and felt much exhausted from it; pulse 90, rather strong; tongue clean; no pain. — Haust. anodyn. stat. Enema anodyn., et cont. mist. cinchon. et frictio.

Vespere. — Stools watery, and of a white colour. — Repet. haust. et enema. Give three glasses of wine per day. This treatment was continued till the 4th November without any material change in his state.

4th. — Tongue red and smooth in parts; stools better, and marked with bile, more copious and consistent; feels generally better. — Cont. omnia.

11th. — Stools becoming perfectly natural in consistence and colour; but he does not gain strength. — Cont. ut antea.

16th. — Tongue cleaner, and more healthy than it has ever been since he first came into hospital; the papillæ restored; he feels a slight griping, and his stools pass

without pain, and without giving him time to prepare himself. Can this be the bark? Cont. ut antea, and add tinct. opii, ℥xxx.; haust. anodyn. h. s. s.

30th. — This laxity went off, and the state of his bowels improves very much; but he evidently loses strength, and wastes; he is not nourished; the motions shew that hepatic bile is mixed with them, and they are of a pale-yellow, but are not of a healthy character. — Omit all medicines, and the friction. Every attention is paid to his diet, and whatever he fancies is given. The diet generally is sugee, sago, arrow-root, milk, and five or six glasses of port wine, and occasionally he takes a mutton chop; but he certainly loses ground, and appears to be gradually sinking.

Dec. 6. — Was very much purged all night, but he is not weaker; pulse small; countenance clear, and more animated; but he does not become stronger, although the medicines have done every thing that could be expected from them.

9th. — Passed a very bad night, and was much purged; pulse difficult to be felt; he cannot look at the light without excessive pain in the eyes; pupils much contracted. I think him sinking fast. — Cont. wine.

10th. — Very thirsty during the night, and longed for sherbet, which was given to him; he was not purged; pulse very small; intolerance of light. — Cont.

Evening. — Has taken his wine and pudding; was not purged; skin covered with cold, clammy sweat; he is sinking fast; wishes for beer, which he had, and swallowed with difficulty. He died about eleven o'clock, P. M.

Examination about six hours after death. — The small intestines were generally in a natural state, but paler than usual; colon much contracted from the commencement of the descending portion to the rectum; from the cæcum to the descending colon appeared natural. The liver was very small, paler than usual, firmly attached to the diaphragm, and studded with white spots, as if there had been ulcers or abscesses, which had broken and cicatrised again. One of these cicatrices was very large, and almost of a cartilaginous consistence in its centre, (see Plate XV.), with light, radiated streaks proceeding to a considerable distance from it. The stomach was much smaller than usual, thickened in its coats, and of a very pale colour; gall-bladder filled with yellow bile, its coats white, and considerably thickened; the lungs and heart seemed healthy; the vessels of the mesentery were full of blood; the mesenteric glands very much enlarged, and of a blue colour. The liver weighed only one pound eleven ounces; and when divided, was pale and firm in its texture, but not otherwise diseased.

Remarks. — This man's previous history could not be further learned than that he had experienced, some years previously, an attack of acute hepatitis, from which he

had recovered sufficiently to attend to his duties; but he had continued to lose flesh, and had at last become so debilitated that he came into hospital. The firm, light-coloured texture of the liver, and pale, thickened state of the coats of the gall-bladder, were evidently the result of a continued and slow state of inflammatory action, kept up by his habits of drinking. The cicatrices were evidently the remains of abscesses, which had formed near the surface of the liver during attacks of hepatitis, experienced long before his last illness, and which had been removed by the treatment then adopted, and the matter formed removed by absorption.

CASE LXXI.—*Chronic Inflammation of the Liver, producing Enlargement of the Liver, with Collections of thick, unencysted, purulent Matter in its Texture; Inflammation, &c. supervening and causing Death.*—*Examination.*—(See Plate XVIII.)

WILLIAM SCHOFIELD, ætat. 29, recently arrived from Europe, although he has formerly been in India in H. M. 84th regiment; was admitted into hospital 10th July, 1816, at Trichinopoly; has complained of ill-health for some time, and of symptoms referable to the liver; but has not considered them of consequence enough to require medical aid. Complains of pain in his belly, sickness at stomach, and a bitter taste in his mouth; the whole abdomen is swelled, and there is something like a tumour to be felt under the right hypochondrium; he is very much annoyed with flatus; pulse frequent and strong; tongue moist; he appears a smart, healthy man; but there is a heaviness in his look that indicates disease of the liver; he appears low-spirited.—Apply twenty leeches to the region of the liver and course of the colon. Enema purg. et calom. gr. xij.

17th.—Has been purged; stools of a bright orange colour, and feculent; the pain in his belly is not so severe as it was, and the tension is not so great; his stomach is still deranged; he has great thirst; tongue white and rather dry.—Mist. purg. ʒiij.

Vespere.—Stools muddy, and of a brown colour; feels easier; very little straining; tongue dry and white.—Calom. gr. xij. h. s. Mist. purg. cras mane.

18th.—Stools copious, natural, of a bright orange colour; much troubled with flatus, and does not pass it easily.—Cal. gr. xij. h. s.; haust. amar. cum sennâ, ʒiij. nocte manequē.

28th.—Says there is nothing the matter, and is discharged.

Returned to the hospital on the 1st August. Complains this evening, six o'clock, of being sick at stomach, and of pain in his loins; pulse frequent; skin rather hot.—Mist. emet. stat. Calom. gr. xij. h. s. s.

7th. — Sickness at stomach the same; has been fully purged; motions highly bilious; tongue pale; feels pain in his belly and small of the back; pulse moderate. — Ol. ricini, $\bar{5}$ ij. stat. Enema purg.

Vespere. — Sickness at stomach continues; motions copious and highly bilious; pulse quicker than it was; passes urine freely; has cold sweats, but no pain at all in his side or in his head. — Mist. salin. febrif. Calom. gr. xij. h. s. s.

8th. — Not so much sickness; feels a fulness about the pubes; made no water in the night; pain in the small of his back; stools dark-olive colour. — Cont. mist. salin. feb. Ol. ricini, $\bar{5}$ ij.

Vespere. — Passed a large lumbricus; feels the sickness the same; stools bilious. — Calom. gr. xij.; opii, gr. j. Ft. pil. Cont. mist. salin.

9th. — Still sick at stomach; stools bilious, mixed with tenacious, viscid matter; feels pain in passing his stools. — Apply a blister to the stomach. Ol. ricini, $\bar{5}$ ij.

Vespere. — Stools highly bilious; pulse 84, distinct; tongue white; sickness the same; feels a fainting sensation when he moves about, and a palpitation of the heart. — Cont. mist. salin., et repet. calom. et opium, h. s.

10th. — No change for the better; has passed some hardened fæces this morning. — Pulv. purg.

Vespere. — He feels no pain at stomach at all, but a constant sickness, and throws up every thing he takes; pulse very good, about 84 in a minute; tongue white and dry—the tongue of excitement, shewing that there is some mischief going on somewhere; skin cool; he passed a large lump of undigested potato in his stools this morning. — Apply eighteen leeches about the stomach. Repet. calom. et opium. Cont. mist. salin.

11th. — Stools are feculent, mixed with variegated, thick, and tenacious matter; no blood; the sickness continues; tongue white and dry; great thirst; felt some relief from the leeches; pulse this morning much quicker, 104 in a minute; skin not peculiarly hot; he is troubled much with phlegm; and has a disagreeable, slimy sensation in his mouth; feels pain just over the pubes, but he is always relieved after making water; he has no pain in the right side, either in the region of the cæcum or the liver; he has a slight pain in his back and in the region of the kidneys. — Enema purg. Apply eighteen leeches to the belly and pubes. Cont. mist. salin. febrif. ut antea.

Vespere. — The pain about the pubes still continues, but not so severe as it was before the leeches were applied. As the constant nausea continued, and he vomited some bilious matter, we gave an ipecacuanha emetic at one o'clock, which brought away much yellow bile, and relieved the sickness. Tongue still white and rather dry;

pulse full, and frequent; skin hot, but moist. — Repet. mist. salin. Calom. gr. xx. h. s. Enema purg.

12th. — Stools full of white viscid mucus, with the appearance of feculent matter, seemingly from the enema. — The sickness of stomach is much less this morning, and he makes water with more ease; has less pain in the belly, and can bear more pressure; his loins are also easier; pulse 90 in a minute, soft, and natural; skin cool; tongue cleaner, but thirst continues. — Cont. mist. salin. ut antea. Mist. purg. Repet. enema.

Evening. — Stools of a dark-brown, clayey, muddy colour; sickness continues; pain much diminished; tongue the same; pulse 84; skin cool. — Calom. gr. xx. h. s. Haust. amar. cum sennâ, ʒij. nocte maneque.

13th. — Tongue the same; he is in much better spirits; stools liquid, and of a natural colour; very much troubled with flatus; sickness better; pulse quick, and rather small; skin cool; still feels pain about the pubes and fundament; makes water better, but it is a long time in passing. — Apply twelve leeches down the sacrum. Pulv. purg. Enem. emol. Repet. calom. h. s. et mist., ut antea.

14th. — Vomited something this morning, which, he says, was like what he passed in his stools; but, on examination, it was merely a dark fluid, tinged with bile; pulse good; he always feels easier after the pill. — Repet. pilul. calom. gr. xx. Enem. purg. Apply eight leeches to the pubes. Cont. mist. salin. Under the impression of a stricture in the rectum, we endeavoured to pass a second-sized bougie, and found a contraction situate about three inches and a quarter up the gut, which completely resisted efforts to pass it. We then tried a very small one, and passed the stricture, but not without pain and much difficulty. After it had passed he expressed great relief.

Evening. — Feels much easier since morning; has passed some dark-coloured stools, with viscid mucus; sickness less; makes water with more ease. — Repet. pilul. calom. gr. xx. Cont. mist. salin.

15th. — Has passed thick, viscid, tenacious bile, in large quantities; had no sickness in the night; tongue much cleaner, and passed water with more ease. — Cont. mist. salin., et repet. pulv. purg.

Evening. — Passed good, feculent stools, tongue still white and dry; sickness returned. — Enema anodyn. Calom. gr. xvj., et haust. amar. cum sennâ.

16th. — Passed a good night, and found great ease from the enema; but, towards morning, he had a call to the night-stool, and has been going there ever since; stools feculent, but fluid; tongue as before; no pain in his belly, but a good deal of pain

about the bladder, particularly when he makes water; feels the stricture in the rectum troublesome and painful. — Introduce the bougie. Ol. ricini. Cont. mist. salin., and foment the pubes.

Evening. — Better; passed feculent stools; tongue the same. — Repet. enema anodyn. Cont. mist. salin. Apply eight leeches to the anus.

17th. — Tongue as yesterday; was easier last night after the leeches, but the pain returned about two o'clock; stools are feculent, with some blood and curdled matter. Repet. haust. purg.; et meridie enema anodyn.

Evening. — Stools like soft, tough leather, of a yellow colour; tongue better; he has had less pain this day. — Haust. amar. cum sennâ, ℥ij. Enema anodyn.

18th. — Stools feculent, with something like purulent matter mixed with blood; felt a good deal of pain in the left ilium before they came away; he is rather easier this morning; tongue more yellow than usual; vomited some bile, and was relieved by it. — Pulv. ipecac. ℥j.

Evening. — Feels more pain this evening in both the right and left ilium, and complains much on pressure; his skin is hot; pulse quick and full; tongue dry; great thirst. — Foment the belly, and apply eight leeches to each iliac region (sixteen in all). Calom. gr. xx. h. s. Acid. nitros. ℥ij.; aquæ puri, ℔ij. M.; to drink at pleasure.

19th. — Stools more feculent, and of a better appearance than usual; tongue cleaner; passed a great deal of wind downwards in the night; pain in the right and left iliac region much relieved by the leeches; pulse full and strong; sickness the same. — Apply a blister to the pit of the stomach. Cont. enema, et haust. amar. cum sennâ.

Evening. — Tongue cleaner than it was; he complains much of thirst; pulse small and frequent; pain in the belly less; has thrown up a lump of thick, viscid matter, having very much the appearance of flesh. — Cont. calom. gr. xx. h. s. Repet. haust. cras mane.

20th. — Passed an indifferent night; tongue brown colour, and furred; feels a fulness in the belly, and some pain. — Enema anodyn. Pulv. purg. Marched from Trichinopoly; and as he was very anxious to accompany the regiment, he was allowed to proceed in a dooly.

21st. — Very much distressed by the march; straining very severe. The medical stores have not come up, but we have managed to give an anodyne enema, which relieved him; and he took the following draught: — R Opii, ʒl.; aquæ ammon. ʒxxx.; aquæ puræ, ℥ij. M. ft. haust.

22d. — Feels very much better this morning; much less straining; and the tongue

is cleaner. — R Ung. mercur. ʒj.; opii, gr. vj. M.; to be rubbed over the stomach twice a day. Repet. enema anodyn. Pulv. purg.

Evening. — Feels much better this evening; less pain and straining; tongue cleaner; pulse quick and small. — Repet. haust. anodyn. Cont. frictio et enema.

23d. — Passed a better night, and feels much easier; still has pain in ano, but he passed stools with more ease, and they are infinitely more natural; thirst not so great; had no vomiting in the night; tongue cleaner; pulse 96; skin cool. — Repet. enema anodyn. Cont. frictio mercur. opiat.

Evening. — Says he feels better; has not had any sickness all day; his thirst continues; tongue cleaner, but his pulse is alarmingly quick; feels some pain in the belly, but not so much as usual, and his motions are better than we have yet seen them. — Cont. ut antea.

24th. — Passed a better night; less pain in ano, and less sickness; tongue cleaner; thirst the same; pulse soft, not at all so quick. — Cont. med. omnia.

25th. — Passed a good night; no material change. — Cont. frictio et pulv. purg.

Evening. — Has been well purged, and feels more pain in consequence; but he says he is better on the whole. — Haust. anodyn.

26th. — Stools perfectly natural; less pain in ano; has still some pain in the right and left iliac region, but it is not so severe as it was, and he feels it less when he is warm; thirst continues; pulse 108, full, and strong. — Cont. frictio. Repet. enema anodyn. stat. et horâ somni.

27th. — Stools variegated; pulse again alarmingly quick, but he passed his stools with less pain; he is much troubled with flatus; excessive thirst. — Cont. med. omnia.

28th. — Stools becoming perfectly natural, and he has less pain; thirst continues; pulse as before. — Cont. med. omnia.

29th. — Much troubled with flatus, and passed a bad night; pulse full and vibrating, 114; thirst; tongue cleaner and moister; perspires very much; vomited green matter this morning; there is no hope of his recovery. — Cont.

Evening. — Pulse 120; countenance much altered; thirst the same; complains of great heat in his belly, particularly in the course of the colon; and he has the sensation of hardness and tightness over that part, and great pain, with some tension, over the epigastrium and right hypochondrium. There is too much disease here to be removed by human art. — Calom. gr. xx. Apply sixteen leeches, and afterwards a blister. Cont. enema.

30th, *Five o'Clock*, A.M. — Slept very little in the night; passed a great deal of

blood in his stools, with some coagula; says he is not worse since last night; his pulse is still quick and full, and he perspires profusely.—Enema anodyn.

30th.—Has passed a perfectly natural motion, with some coagulated blood; vomits acid matter.—Magnes. ℥ij.; aquæ ammon. ℥xxx.; aquæ puræ, ℥ij.; elix. pareg. ℥ij. M. ft. haust.

Evening.—Stools much improved, quite natural; no pain in his belly, but he feels pain in the scrobiculus cordis, and sickness; cannot lay on the left side without a dragging sensation and pain.—Repet. haust.

31st.—Complains this morning of pain in the course of the liver and stomach; he fancies himself better, but he is evidently sinking. He died in the night.

Sept. 1st, Five o'Clock, A.M. Examined the Body.—On opening the abdomen, the liver was found very much enlarged, filling the whole epigastrium, and completely covering the stomach and colon, so as to prevent any part of them being seen. The liver weighed six pounds, and was studded with small abscesses throughout its whole substance. These abscesses consisted of a thick matter, which did not fill the cavities containing it. There were no cysts, and the substance of the liver surrounding these collections of matter was not more vascular or more inflamed than in any other part. The whole internal texture was vascular, firm, and of a deeper colour than natural. Some of these collections of matter were very superficial, and elevated the external coat of the liver in the form of white tubercles. (See Plate XVIII.)

The colon was much contracted throughout its course, and thickened in its coats; and about the rectum the constriction was very great: the strictures were in two places, immediately above the sphincter ani and at its juncture with the colon. There were also adhesions between the rectum and the bladder, but not very firm. The whole of the colon, from the cæcum to the rectum, was changed in its structure; and large, foul ulcers, filled with deep sloughs, were found, particularly in the sigmoid flexure, cæcum, and head of the colon. The transverse arch was much discoloured, but there was not any ulceration.

The stomach was full and flaccid; the lungs were sound; and there was more water in the pericardium than is usual. In the right ventricle and auricle of the heart was found a large mass of coagulable lymph, which nearly filled these cavities. The left auricle and ventricle were sound and unchanged. The kidneys appeared large, but not diseased.

Remarks.—This case presented very marked symptoms of chronic inflammation of the liver, which were removed by the treatment adopted on his admission; but the supervention of inflammatory disease of the bowels masked, in a very great measure,

whatever disorder of this viscus may have subsequently existed. The disease of the bowels, which terminated the patient's existence, will be considered in the sequel. We have introduced the case at this place in order to shew a consequence of chronic inflammation of the liver, which is seldom or ever fatal of itself, and terminates so chiefly from inducing disease of the colon.

CASE LXXII.—*Chronic Disease of the Liver; Death from Epidemic Cholera.—*
*Dissection and Remarks.**

“ *February 1818.*—EMMERSON was seized about one o'clock in the morning with spasms in his limbs, purging, vomiting, pain at stomach, and great anxiety. By neglect of the orderly, he was not reported till between five and six o'clock, A.M., when he was ordered a dose of laudanum, and taken into the hospital. The vomiting and purging had ceased, the spasms had nearly gone off; but the pain below the pit of the stomach, and the most distressing anxiety, continued; the countenance was pale; eyes heavy, red, and inflamed; pulse weak; temperature of the extremities greatly reduced; thirst most urgent. On admission into the hospital, he took a scruple of calomel; at ten o'clock he was bled to fourteen ounces; more blood could not be procured. After bleeding, the pulse became more weak, and the anxiety continued. He was put into a warm bath before eleven o'clock. He said he felt easier. The pulse rose a little. A blister was applied to the pained part of the abdomen; and at two o'clock a scruple of calomel was given. He slept a little after coming out of the bath. He lingered till one o'clock, when he died.

“ *Dissection.*—The viscera had a general red appearance; the omentum contained little fat, but its blood-vessels were distended. The stomach was laid open and found internally inflamed, being of a dusky-red colour, covered with reddish mucus; in some parts the villous coat was abraded; towards the pylorus the marks of inflammation were greatest, but there was no thickening, nor even a single corrugation to be seen. The under part, near the pylorus, was of a dirty-brown colour; there was some of the calomel found adhering to the inner surface of the stomach, as it were imbedded in the mucus, and about a pint of thin, watery, grey-coloured fluid in the stomach. Bilious matter, of a yellow colour, was found in the duodenum. The duodenum exhibited no marks of disease. The small and large intestines were of a

* For this case, with the accompanying remarks, we are indebted to Dr. Badenoch, whose general knowledge and experience of the diseases of India entitle him to the greatest confidence and respect.

natural red appearance. Spleen much enlarged, weighing upwards of two pounds. The liver was of the natural size, and of a brown-nankeen colour externally: its structure was hard and firm, and, when divided, like new cheese, and containing very little blood. Its surface was rough, and covered with inequalities or small tubercles, about the size of peas; its lower edge was bent inwards and adhering to the neighbouring parts, and was of a dark colour. The whole internal substance of the liver was of a light-pink colour; the gall-bladder was shrivelled, containing about half an ounce of dark-green bile.

“ *Remarks.*—This man was first admitted into the hospital on the 10th September last (1817), with a swelling in his groin; for which he was freely purged. After being in hospital eighteen days, he complained of pain in his left side, where some hardness and swelling were found. He took calomel and other purgative medicines, and was discharged on the 6th October. This seems to have been the commencement of his disease. There were then swelling and hardness to be felt in the left side; but at what period the liver began to suffer from disease, I am not able to say; whether before or after the use of mercury, is not easily to be determined. I cannot, however, suppose that the whole structure of this viscus can be changed so completely except after a very considerable time. The secretion of bile must have been very much changed both in quantity and quality. This case answers very nearly to the tuberculated liver of Dr. Baillie, said to be generally occasioned by the free use of ardent spirits. There was very little bile in the gall-bladder, and scarcely any in the duodenum or small intestines. When the liver is of a pale colour, the bile is generally scanty: this state of the biliary secretion seems generally to obtain in chronic dysentery. Does mercury certainly arouse the action of the liver? If it does, the exhibition of it in acute inflammation of the liver must do harm. It can only be serviceable where the circulation is tardy, the blood accumulating in the portal vessels, and secretion lessened.”

The exhibition of mercury in hepatitis, whilst inflammatory action is acute, is often hurtful, and tends to the production of abscess, unless when given with the view of producing its purgative effects only. When, however, active inflammation is removed, then the mercurial action on the liver is necessary to elicit a free and healthy secretion of bile, and thereby to remove existing congestion and accumulations of acrid bile, as well as to restore the healthy and free state of the circulation of the organ.

The following Cases are given with a view of illustrating still further the organic changes to which the liver is liable in warm climates. The details

of treatment, and of the daily progress of the symptoms, are omitted, as they furnish nothing of much importance, or beyond what has been already adduced.

CASE LXXIII. — *Chronic Disease and Atrophy of the Liver, Pneumonia supervening, and producing Death. — Dissection.*

— HEFFERMAN was received into hospital with a pulmonic affection of some standing and considerable severity. Owing to the disordered state of his bowels and appearance of his motions during his illness, the pulmonic disease, although at that time the most marked, was considered as consequent upon diseased liver: but no enlargement of the liver could be detected; the bowels were remarkably torpid, and the stools deficient in bile.

Upon Dissection, the lungs were found adhering to the adjoining parts; the right lung was partially hepatised, and readily sank in water. There was a large vomica in the left lung. The liver was small, of a much harder texture and paler colour than natural; and when divided, it exhibited a granulated appearance, and pale flesh colour. There was no bile in either the gall-bladder or hepatic ducts.

CASE LXXIV. — *Softening and Congestion of the Liver, &c.*

THOMAS FAIRFIELD, Sergeant, Artillery, came into hospital, after having been complaining in his quarters for several days, but had not applied for assistance. On his admission, he complained of great oppression and anxiety at the epigastrium; of cold perspirations; weak, oppressed pulse; and watery motions. Leeches and blisters were applied, and calomel at night, with tonic aperients in the morning, and stimulants through the day. He died in the course of the day after his admission. This man had been drinking extremely hard for some time before his attack.

Dissection. — On opening the chest, considerable adhesions were found between the pleura pulmonalis and costalis; the lungs were gorged with blood, and hepatised; and in the left cavity of the thorax a considerable quantity of a sanguineous fluid was found. The right lobe of the liver much enlarged, full of blood, soft, and friable, and of a purple colour. The bowels and stomach of a healthy appearance, and free from disease. On opening the head, the pia mater was seen more vascular than in health, and a few patches of coagulable lymph on its surface. Small white eminences were found on the surface of the pia mater of the left hemisphere. Serum was observed in small quantities in the lateral ventricles and basis of the brain. On exposing the

spinal canal, from the first cervical to the second lumbar vertebra, a considerable portion of serous fluid was found in the vertebral canal. Slight congestion of the vessels of the chord were also observable through its whole extent.

CASE LXXV. — *Chronic Disease of the Liver; Tubercles intermingled with small Abscesses, &c.; Death from the Supervention of Dysentery.—Examination.*

WILLIAM BATES, Private, Madras European Regiment, had been long suffering under disorder of the biliary functions, to which supervened a deranged state of the bowels and obstinate dysentery. He at last sank under inflammatory action of the peritoneal covering of the intestines, consequent upon ulceration of the bowels.

Dissection, three hours after Death.—Thoracic Viscera.—The lungs were healthy in their substance; but the pleura pulmonalis and costalis were adherent to each other, and a small quantity of serum was collected. The pericardium was considerably distended with fluid.

Abdominal Viscera.—The omentum was much loaded with fat, and adhered to all the viscera lying below it; also to the os ilium of the left side, and to the sigmoid flexure of the colon: upon its being torn away, the coats of the gut were torn through.

Liver—was studded over its surface with light-brown-coloured tubercles, and with a few small abscesses at the right edge of the right lobe; and, when cut into, shewed the same tuberculated appearance. The tubercles seemed to be of a gristly nature; and when divided, they emitted a glairy fluid. There were some small collections of purulent matter scattered throughout the substance of the liver. One of the small abscesses had penetrated the external surface of the viscus, and partly through the coats of the colon, where it adhered. The spleen was healthy; gall-bladder empty; stomach healthy. The small intestines were united to each other by coagulable lymph. They were sound in their structure, excepting the extremity of the ilium, which was ulcerated for four inches from its connexion with the caput cæcum coli. The colon was in a state of gangrenous ulceration throughout, with many openings through the coats of the viscus. It was adhering to all the surrounding parts, and one opening had also nearly penetrated through the duodenum. The urinary bladder seemed highly inflamed. The abdomen was filled with serum, which contained white, flaky particles mixed with it, and some feculent matter.

CASE LXXVI.—*Chronic Disease of the Liver, from the Abuse of Spirituous Liquors.*

MICHAEL FAVELLIE, Artillery, had long suffered under symptoms of chronic disease of the liver, for which he had frequently been under treatment, and been relieved; but habitual drunkenness generally aggravated his complaints. Chronic dysentery at last supervened, under which he sunk.

Upon Examination, the liver was found very considerably enlarged, of a whitish colour, and studded with pale-red and brick-coloured, small spots. When divided, it seemed of the consistence and appearance of light-coloured clay. The convex surface of the organ adhered to the right side; and its anterior and internal edge to the intestines. The gall-bladder had formed adhesions to the duodenum. The small intestines and colon were constricted, and the latter ulcerated in its internal coats.

CASE LXXVII.—*Chronic Hepatitis, followed by Congestion, &c.; Death caused by Inflammation and Gangrene of the Colon.—Examination.—(See Plate XVII. Fig. 2.)*

PATRICK ELLIOTT, Trichinopoly; a young man; had suffered attacks of hepatitis in a chronic form; he had recently been punished for drunkenness and misconduct, and was admitted (on the 26th of March) into hospital immediately afterwards. He was seized on the night of his admission with dysenteric symptoms, for which a dose of castor oil was given, which brought away copious foul stools, with blood and mucus. The tormina and tenesmus, with dysuria, increased, and twenty ounces of blood were taken from his arm with relief. The warm-bath, alteratives, aperients, and diaphoretics; were prescribed on the following day; and sixteen leeches were applied to the abdomen. On the 28th, the dysenteric symptoms were all relieved; the medicines were continued, and a blister applied.

29th.—His pulse is 90, soft; tongue yellow and moist; stools feculent, but tinged with blood. It seems that the present attack has been occasioned by his having consumed a large quantity of solid opium previous to his punishment. A dose of calomel was given at bed-time, and an emollient enema administered. Castor oil was taken in the morning; and the mist. salina, with spirit. æther. nitros, every two hours throughout the day.

30th.—Twelve leeches were again applied near to the seat of pain in the cæcum. Considerable tumefaction of the abdomen was present, with thirst; stools copious, feculent, and bloody; tongue white and pasty; pulse 90, and regular.—Calomel and an emollient enema at bed-time, and the saline mixture every two hours. Aperient draught in the morning.

31st. — The stools are passed involuntarily, are feculent and morbid; pulse 108; respiration frequent; tongue white, dry, and clammy; great anxiety and restlessness; abdomen more tumid. — The symptoms and treatment continued as above until the fifth of April, when a fœtor exhaled from the body, and he became incoherent.

He sunk gradually, and died in the evening of the 7th. During the latter days of his illness, it is incredible the quantity of liquid, feculent matter that was passed daily from his bowels.

Examination, two hours after Death. — Upon removing the parietes of the abdomen, strong adhesions were observed to have been formed between the peritoneum and the diseased omentum. The latter was much thickened, of a dirty-brown colour, and closely attached around the colon and along its whole course, connecting that intestine by adhesions with the right lobe of the liver on one side, and with the spleen and parietes of the abdomen on the other. The colon internally presented a surface of ragged ulcerations and sphacelated spots. In some parts its coats had lost all their natural tenacity, yielding to the smallest force. The rectum was equally diseased. The small intestines were healthy, and contained much feculent matter. The liver was much enlarged, harder and denser than natural. Right lobe of a dark-purplish, livid colour, (see Plate XVII., fig. 2.) with one or two suppurated spots on its concave surface. Its structure was natural externally; but when cut into, discharged thick, black blood. The left lobe was sound, and of a healthy colour. In the gall-bladder a moderate quantity of bile: its coats were of a white colour. Stomach contained a quantity of dark-coloured, inodorous fluid: its coats appeared more corrugated than natural: no appearance of inflammation. The bladder empty and quite sound. Thoracic viscera in a sound state.

Remarks. — The depletions in this case, which was treated by one of our assistants, were not sufficiently active; the state of the pulse, and other circumstances of the case, not seeming to require greater decision in this respect. About fifty-six ounces of blood were, however, taken during the first three days of his illness.

CASE LXXVIII. — *Chronic Hepatitis; Acute Hepatitis, with great Congestion, supervening: Coagulable Lymph formed in the right side of the Heart, &c. causing Death.* — (See Plate XVII. fig. 1.)

JOHN RITSON, recruit, aged 26, just arrived from England, was admitted on the 6th July, 1816. He had a slight attack of bowel complaint last month; at present he

complains of passing frequent watery stools, with considerable griping. — Capiat mist. amar. cum sennâ, ℥ij. stat.

Vespere. — Stools fetid; pain of the belly severe. — Adhibeatur parti abdominis dolenti hirudines xvij. Hydr. submur. gr. xij. h. s.

7th. — Stools gelatinous and feculent, mixed with some blood; he feels better this morning. — Capiat pulv. jalap. comp. ℥j. stat.

Vespere. — Pulse quick and small; skin moist; tongue parched; taste bitter; much sickness at stomach; stools of various colours, with the appearance of blood. — N.B. The purgative was repeated before an operation was procured. — Habeat mist. emet. stat.; atque hydr. submur. gr. xij. h. s.

8th. — The vomit operated very well; he ejected much greenish matter, and was easier; but after taking the calomel pill, the nausea returned; pulse quick and full; skin cool, moist; tongue dry and furred; stools frequent, green, frothy, tenacious, mucous; no pain, except from weakness. — R Mist. salin. ℔j.; spirit. æther. nitros. ℥ij.; aq. ammon. ℥ij. Fiat mistura, cujus ℥ij. omni horâ capiat.

Vespere. — He had a cathartic powder, which has operated slightly; breathing laborious; pulse 102, hard, and full; tongue dry and furred; sickness of stomach; stools green, feculent, and mucous; he complains of slight pain of the bowels. — Omit. mist. salin. Emit. sanguis à brachio ad ℥xviiij. vel ℥xx. Habeat hydr. submur. gr. xij. Injiciatur enema purgans.

9th. — He was much better after the bleeding, but felt pain over the abdomen during the night, which he imputes to costiveness; pulse 102, full, and strong; tongue dry and furred, with a white crust; vomition of green, viscid mucus, floating on water; urine scanty, but passed freely; he complains of a dull soreness over the belly on pressure. — Adhibeantur scrobiculo cordis hirud. xvj. Repet. enema purg. Habeat pulv. purg. stat.

Vespere. — The leeches relieved him a great deal, and he feels much easier this evening in every respect; medicine operated well; respiration interrupted by deep sighs; pulse 102, full, and strong; tongue the same as before; no sickness at stomach; no pain of the abdomen on pressure; he complains of oppression in the chest, accompanied with the sensation of approaching syncope. — Descendat in balneum tepidum. Applicetur ad epigastrium emplastrum lyttæ. Sumat hydr. submur. gr. xij. Repet. enema purg.

10th. — The blistered surface rose well; the bath procured him some rest; pulse still full and frequent, but not so strong or hard as it was yesterday; skin cool and moist; tongue furred, but in a less degree; thirst very urgent; oppression in the

chest less painful; sensation of fainting less frequent, but he feels tightness over the epigastrium, which he imputes to the bandage of the blister, without reason. — Repet. enema purg. R Infus. amar. ℥j.; infus. sennæ, ℥j.; sodæ sulph. ℥j.; ol. menth. piperitæ, ℥ij. Fiat haust. stat. sumend. Sumat tinct. rhei, ℥j. meridiæ. Habeat pro alimento panem et lac tepidum.

Vespere.—The injection was repeated at one o'clock; pulse better, still feeble; skin cool and moist; tongue furred; oppression in the chest abated; great debility; he is much dejected. —R Hydr. submur. gr. xv.; ammon. subcarb. gr. ij.; syr. simp. q. s. Fiat pilul. stat. sumend. Capiat tinct. rhei, ℥j. horâ nonâ. Habeat vini cyathos duos in vespere.

11th. — He slept a little during the night; the cathartic medicine produced frequent scanty evacuations; the respiration, which was better in the night, became worse towards morning; pulse very frequent and small; skin cold and clammy; tongue furred with a brown crust; stools greenish brown; no pain. —R Mist. purg. ℥j.; tinct. sennæ, ℥ss. Fiat haust. stat. sumend. repetendusque post horam, nisi prius benè responderit alvus. Repet. enema purg.

The medicine operated freely; warm water in bottles has been applied to the sides and feet, and the limbs have been stimulated by constant frictions with flannel; warm wine was administered every half hour; but nothing produced any change, and at three o'clock he died.

Examination, two hours after Death.—The right lobe of the liver was considerably enlarged, and pressed on the thorax; the upper part was of a blue-purple colour, marbled, and had the appearance of an old cicatrix, from which it is concluded he must have had hepatitis before he came to India. A small, brown streak down the centre of the convex surface appeared. The margin of the right lobe was of a dark-blue colour, about two inches in breadth, and when cut it bled profusely. The other parts of the liver were of a pale, reddish-brown colour, and more tender in the structure than usual, but did not bleed when divided: the purple colour was confined entirely to the surface. (See Plate XVII. fig. 1.)

The gall-bladder was much enlarged, and filled with dark-green inspissated bile.

The omentum was a mass of fat, and had no blood-vessels visible. The mesocolon and mesentery contained much adipous matter, possessed great tenacity, and resembled in colour and substance a bit of moist, yellow leather.

The stomach was filled with a black fluid, and in many parts indicated a great degree of inflammation, particularly towards the cardia.

The head of the colon was greatly inflamed: purplish-red spots were visible through

its whole course, and through the whole of the rectum. The colon adhered to the peritoneum, and was so tender, that it rent in many places like moistened paper.

The lungs were healthy, and had formed no adhesions. More water was found in the pericardium than usual. The right auricle and ventricle of the heart, and the pulmonary artery, were completely filled with a large, thick, firm mass of the fibrinous part of the blood, which had not yet coagulated in the larger vessels. The left ventricle and other viscera were healthy.

Remarks.—This man had been complaining for some time of symptoms of disease, which had been referred to his bowels, but which had most probably depended upon, and been occasioned by, chronic disease of the substance of the liver, and congestion of the portal vessels. He was under the care of one of our assistants, and was seen by us only a short time before his death. The combination of opium with the calomel, on the second day of the report, might have been advantageous; and although bleeding had been largely employed, it might have been carried still further, particularly on the evening of the ninth. The sudden supervention of fatal symptoms, in this case, evidently proceeded from the formation of the fibrinous concretion in the right side of the heart and entrance of the pulmonary artery.

SECTION III.

Of the Symptoms and Nature of Abscess of the Liver.

WHEN inflammation of the liver, especially of its internal structure, is not treated with sufficient decision in its early stages, the formation of one or of several abscesses is a very frequent consequence. This termination of the more active forms of hepatitis generally arises from two circumstances—namely, either the disease is not met, on the part of the practitioner, with sufficiently decisive and prompt measures; or, owing to the silent and insidious manner in which it frequently supervenes and runs its course in the substance of the organ, its nature and extent are not detected until this particular organic change has made itself, in one way or another, sufficiently manifest.

Abscess is very frequently a consequence of the forms of inflammation of the liver which we have described in the first section of this chapter, and which are, as we have shewn, of a more or less active nature, although often not manifested by many acute or painful symptoms. It also supervenes to inflammatory action of a less questionably chronic form, as we have already noticed; and it often follows upon that state of increased vascular action of the substance of the organ which seems to be intermediate to acute and chronic disease, and which may be ranked either with the one or the other form, according to the meaning attached to the words acute and chronic. When suppuration takes place, it is also owing generally to several subordinate circumstances to those already specified,—there is either something favourable to its supervention in the state of constitution or diathesis of the individual, or in the vascular condition of the organ, or in the concurrent circumstances and phenomena of the case. In illustration of this position, we may notice that the sanguine and scrofulous habits are particularly liable to this termination of hepatic inflammation;—that it may with great justice be dreaded by the practitioner, when he finds, upon examination, considerable tumefaction of the organ accompanying the early stages of the disease;—and that it frequently supervenes to the insidious inflammation of the substance of the liver, which often accompanies, if it does not actually occasion, a particular variety of dysentery, and which, although not generally manifested by acute symptoms referable to the region of this organ, is not the less active as respects its progress and termination. Indeed, in many instances, the practitioner of extensive practice in India will find, when the early stage of inflammation of the liver is accompanied with much fever, a heavy aching pain, and great tumefaction in the region of the organ, that it is very difficult to prevent the supervention of suppuration even by the most prompt and copious depletions, and by the most active employment of mercurial remedies. It frequently happens also that considerable enlargement of the liver is observed as a sequela of active disease of the viscus, even although much decision may have been evinced in the treatment, and the most urgent symptoms have been subdued. But, in such cases, enlargement of the organ is the result of some degree of effusion of lymph in the interstices of the inflamed tissue, and

denotes a similar state of parts to that marking the previous existence of inflammatory action in more superficial and more tangible glands. Indeed, inflammation of the liver, especially of its internal structure, may be considered as resembling that of any other glandular body: when inflamed, it is generally tumid; and this tumidity arises from similar causes, in conjunction frequently with congestion of blood in the portal and hepatic veins, and accumulations of bile in the ducts. As in other glandular parts also, and in the cellular tissue especially, so is there a disposition inherent in tumefaction of the liver to terminate in abscess, in proportion to the extent to which it is present, and the powers of the constitution impaired; and even when this particular state is so far subdued as to prevent the accession of this unfavourable consequence of vascular disorder, it will still remain to a considerable extent, owing to the effusion of lymph in the affected part. It is owing to this circumstance that tumefaction, with evident soreness of the organ upon pressure, is so often remarked during the decline of the disease; and it is chiefly in promoting the quick removal of this effect of the morbid vascular action, that a short mercurial course is so beneficial in the treatment of hepatitis after depletions have been sufficiently practised. When tumefaction remains for any time as a consequence of inflammation, or when improper means are made use of in order to remove it, or when the patient is exposed to hurtful influences and causes, and allowed to indulge in stimulants, or to experience mental or physical excitants, before it be entirely removed, and the functions of the bowels restored to the healthy state, it becomes the centre of vascular disorder, in which abscess rapidly supervenes, owing to the predisposition of the vessels of the part to undergo the suppurative process derived from their previous state of disease. The following case exemplifies this occurrence.

CASE LXXIX.—*Relapse of Hepatitis, followed rapidly by Abscess opening into the Colon.—
Examination after Death.*

JOHN IUDEN, aged 33, had been under treatment for inflammation of the substance of the liver, attended with many of the symptoms detailed in our description of the disease. General and local depletions had been practised, and the morbid secretions

carried off by means of purgatives. He soon recovered sufficiently to warrant his discharge from hospital. The day after his discharge he was required to mount guard, and was seized during the night with cold shivering, succeeded by heat and flying pains of the belly, accompanied by vomiting. These symptoms increased daily; and to-day (26th of April, 1816,) he came to the hospital, with considerable fever superadded. — He took a purging powder, and was ordered the saline mixture. Calom. gr. xij. h. s. Tamarind drink.

27th. — Had rather a restless night; much fever and general pain of the body; pulse 90; skin moist; tongue whitish; no sickness or pain of abdomen; thirst; stools clay-coloured. — Pulv. purg. Cont. mist. salin.

Evening. — Had copious stools, of a bright-yellow colour; much heat and anxiety, but upon examination there is no pain or swelling; skin moist; tongue loaded; some headach; pulse 100, and soft; much thirst. — Cont. mist. salin. R Submur. hydrarg. gr. xij. Tamarind drink.

28th. — Slept a little in the night, and feels rather better this morning; pulse 86, full, and soft; skin warm and moist; tongue less loaded; still great thirst; two stools, rather scanty and watery; no anxiety. — R Submur. hydrarg. gr. x.; ext. colocynth. gr. xij.; cons. rosæ, gr. xij.; ol. anisi, mij. Ft. bolus. Cont. mist. salin., haust., et potus tamarind.

Evening. — Pulse 96, and soft; stools very foul and copious; skin warm and moist; tongue cleaner; his spirits much depressed, (a sure sign of mischief going on in the liver,) although he makes no complaint of pain; thirst less. — R Submur. hydrarg. gr. xij. Continue tamarind drink and saline mixture.

29th. — Is better; had some sleep; stools very foul; pulse 90; skin moist; tongue cleaner; still there is some degree of fever and thirst. — Pulv. purg. Cont. mist. salin.

Evening. — Stools very foul, and of a dark-green colour, liquid, and offensive; still some fever; pulse 96, soft; tongue white; felt some return of appetite; very thirsty. — R Calom. gr. xij. Continue saline mixture and tamarind drink.

30th. — Had a restless night; his pulse is upwards of 90; skin with warm perspiration; tongue cleaner; bowels opened, but stools scanty, and of a dark-green colour. — R Pulv. purg. Cont. mist. salin. et potus tamarind.

Evening. — Pulse 96, and firmer than in the morning; complains of the sense of heat about the pit of the stomach; frequent eructations of acrid air. — R Submur. hydrarg. gr. xij. formâ pilul. R Aquæ menth. pip. ℥ss.; aquæ ammon. ℥ss.; aquæ fontanæ, ℥j. Ft. haust. Cont. mist. salin.

May 1st. — Had some sleep; stools are scanty and foul; some fever in the night;

to-day is better ; pulse 86 ; skin moist ; tongue white ; thirst less urgent ; no appetite. — A wine-glassful of the bitter purging infusion, and repeat it till the bowels are opened. Continue the saline mixture and tamarind drink. Give the calomel at night.

2d.—Complains of severe pain and griping, which kept him awake all night ; was fomented ; passed much flatus, which relieved him. — R Ol. ricini, ℥jss. ; aquæ menth. pip. ℥j. Cont. mist. salin.

Evening. — After this morning visit, violent griping and pains of the abdomen came on. A blister was applied, by which he is much relieved. Pulse very frequent ; skin hot, but moist ; he appears very restless and uneasy. — R Aquæ pip. ℥j. ; ol. anisi, ℥ij. ; tinct. opii, ℥xx. M. ft. haust. s. s.

3d.—Slept pretty well ; no griping ; frequent and irritable pulse ; tongue white ; some appetite. — Repeat his draught immediately, and at 8 o'clock, P.M.

4th.—Passed a good night ; seems exhausted ; tongue covered with dry crust ; had four stools yesterday ; pulse 100, soft. — Pulv. purg. Cont. mist. salin. et pot. tamar.

Evening. — Skin very hot ; tongue foul ; pulse 102 ; much depression of spirits ; stools passed were copious and very foul, of a dark colour ; no uneasiness of the belly. — Cont. mist. salin. R Calom. gr. x. ; pulv. jalap. gr. xij. ; ol. anisi, ℥ij. ; stat. sumend. Cont. omnia.

5th.—Stools watery ; no pain ; heat less ; an indifferent night ; appears languid this morning ; pulse 90, small ; tongue cleaner ; thirsty. — Cont. mist. salin. et potus tamarind. Repeat his draught.

Evening. — Pulse 100 ; tongue covered with a hard crust ; thirsty ; skin moist. — Cont. mist. salin. Purging injection at night.

6th.—Stools copious, and of a yellow colour, fluid, no pain on passing them ; pulse 90 ; skin covered with warm perspiration. On examination, an obscure tumour may be detected under the right false ribs. — Unguent. mercur. ℥ss. tumori.

Evening. — Tumour as before ; no throbbing or uneasiness in it, unless when pressed — Cont. haust. efferv. sine laudano. Appl. catapl. tumori. Purging injection at night.

7th.—Had some sleep after his draught ; no sweating in the night ; tumour appears somewhat red from the use of the poultice ; pulse 90 ; skin rather hot ; no vomiting ; tongue foul, as usual. — Cont. mist. salin. et potus tamarind. A wine-glassful of the bitter purging mixture, and repeat it. A purging enema at 12 o'clock, if bowels are not opened. Continue the poultice without the mercurial ointment. — About 9 o'clock, A.M., after taking the bitter infusion, he felt an inclination to go to stool, when he passed a large quantity of blood and pus, about three pints, from which he has been much weakened. The tumour of the abdomen has subsided.

Evening. — Since the last visit had another stool, by which about lbss. of dark-coloured blood was passed; seems very low; vomited twice; pulse very frequent and feeble; very thirsty; tongue dry, and of a brown colour. — Decoct. cinchon. et vin.

8th. — Had an enema last night, consisting of a strong decoction of bark, ℥jv., and tinct. opii, ʒij. after another discharge of blood; since then had no stool; an infusion of bark does not remain on his stomach; takes wine, however; had no sleep in the night; pulse 120, very feeble; tongue brown, but moist; skin warm, with rather clammy moisture. He sank from this time. — Wine, effervescing draughts, &c. were given.

Died on the morning of the 10th.

Appearances on opening the Body, three hours after Death. — Omentum was transparent and healthy. A large tumour was observed projecting from under the concave surface of the liver, which, on being opened, discharged about a pound of dark sanious blood. Upon more intimate examination, it was found to be a portion of the colon, extending a considerable way under the right lobe of the liver, and communicating with a large abscess of this viscus, containing a mixture of pus and grumous blood. Left lobe was healthy. The inner surface of the colon was diseased, presenting numerous small ulcerations. The canal was unusually contracted, except at that part which adhered to the liver. Small intestines were sound. Stomach and spleen were also sound. The thoracic viscera healthy.

Remarks. — This case was treated by one of the assistants during our absence from the regiment. Bleeding, particularly local bleeding, ought to have been instituted soon after his re-admission, on the 26th of April.

In cases of the above description, and in debilitated individuals of a scrofulous diathesis and sanguine temperament, abscess very frequently forms both suddenly and unexpectedly, and often without any very prominent symptoms preceding or marking its supervention. In the strong, plethoric, and unimpaired constitution, the inflammatory action preceding suppuration is generally active, and productive of more or less symptomatic fever, and local signs, by means of which approaching mischief may be suspected and guarded against.

We have stated in a former part of this work, that there may exist two states of congestion of the liver, the one differing very much from the other; namely, congestion of the portal system of vessels and of the hepatic veins,

and engorgement of bile in the hepatic ducts. These, although often existing separately, frequently also are present at the same time, and are not uncommonly, either collectively or individually, connected with accumulations of bile in the gall-bladder. These states often produce great disturbance of the system, according to the degree in which they exist, and the constitutional peculiarities of the patient, and often induce inflammatory action, as we have already shewn, with great tendency to the suppurative process; this tendency being in proportion to the degree of congestion of the vessels, and consequent tumefaction of the organ. When the habit and constitution of the patient are unimpaired, and the vital energy of the organ has not been overpowered, the congestive states above enumerated are generally relieved by means of a healthy reaction of the circulation of the organ, and a free secretion of bile; and if the reaction thus induced should run to inflammation, it will readily subside under a depletory plan of cure, and the functions and circulation of the organ return to their healthy condition. But when, owing either to a scrofulous diathesis, deficient tone of the organ, or obstruction to a free circulation in any part of the viscus, or irritation of its vessels in a particular part, or impediment in the way of a free discharge of bile into the duodenum, great tumefaction of the organ supervenes to, or accompanies, the inflammatory state, the formation of one or more abscesses is much to be dreaded; and when tumefaction of the organ is detected, the most active means are required to prevent this consequence, although they cannot always succeed in averting it. Thus it will be seen, that the supervention of abscess of the liver will depend much upon the peculiar constitution of the patient, and pathological state of the organ, both previously to, and during, the inflammatory process; and, indeed, these circumstances will more readily induce the suppurative process than the activity of the pre-existing inflammation.

Congestion of the liver, and accumulations of bile in the biliary apparatus, may induce various diseases, without giving rise to inflammation and abscess. But this issue is entirely dependent upon conditions of the system and organ, and upon the causes whence these particular states of the organ have arisen. When the powers of the constitution and of the liver are not materially

impaired, and when these states of the organ have been induced by the influence of miasmata, bilious inflammatory or bilious remittent fever may be the consequence, and the morbid condition of the biliary organs may be removed during the general febrile commotion of the system. In other cases, the reaction of the organ overcomes the congestion, and occasions a free discharge of bile, with the concomitant phenomena of a simple attack of increased secretion of bile and bilious diarrhoea. In some, inflammatory action is established in a more or less acute and active form, giving rise to states of the organ and to symptoms depending upon various constitutional peculiarities proper to the individual, and upon the circumstances in which he is placed.

When the inflammatory action is very acute, and accompanied with the congested state of the organ so often alluded to, abscess then rapidly forms, if the disease be not arrested; but its formation is preceded by signs which ought to lead the practitioner to the adoption of measures which seldom fail of preventing its supervention. It is chiefly owing to some fault in the state of the viscus and constitution of the individual, that it takes place during acute and well-defined hepatitis. Although plethoric and robust young men are very subject to attacks of active hepatitis, characterised by the more acute signs already described; yet, under a judicious and decided plan of cure, abscess very seldom occurs amongst them. But it is chiefly in the more insidious cases of inflammation of the substance of the organ, when the symptoms are but ill defined, and by no means acute, that the supervention of abscess is to be dreaded. Such cases are commonly met with amongst the fair-complexioned, the scrofulous, the relaxed and leuco-phlegmatic, the enervated, those subject to bowel complaints, and the sedentary. In such individuals there is often little or no appearance of existing inflammatory action, and the symptoms complained of are often equivocal. In them also, even where inflammation is most evident, it assumes the chronic or even the passive form: there is often no definite sign which will guide the judgment of the practitioner that abscess is forming, although experience will enable him to decide upon the existence of disease of the liver. In cases of this description, patients often neglect themselves, until it is too late to prevent the termination in abscess, if, indeed, abscess be not already formed; and when they come under medical care, some consecutive disease may have

made its appearance, — such as dysentery and chronic diarrhoea, which may mark the primary malady, and engage the whole attention of both patient and physician. Such cases will receive attention from us amongst the more chronic forms of hepatic dysentery with abscess.

Indeed we may look upon abscess of the liver in the same light with abscess of any other part of the body, and that precisely the same changes take place in its formation. We know that collections of matter sometimes form in external parts of the body without any marked rigors or constitutional disturbance, and even without much fever; and a similar occurrence may supervene with respect to the liver. The symptoms which usher in the formation of abscess in many instances seem to depend more upon the habit and constitution of the individual, or the magnitude and extent of mischief at the period that the suppurative process is beginning, than upon any invariable change in the system necessary to its commencement, and regularly indicated by certain signs. When the inflammatory action going on in an organ or part is not very acute, and is not attended with great general excitement or high symptomatic fever, and when the constitution is characterised by a scrofulous or tuberculous tendency, then abscess may, and indeed does, supervene in the liver without giving any precise warning, until the very last stage of the suppurative process, when the aggregate of the symptoms may lead us to infer its existence, or its communication with some other viscus renders it manifest. When, on the other hand, the inflammatory action has been acute, the powers of life not materially overwhelmed, and the diathesis and habit of the individual not much in fault, the commencement and progress of abscess of the liver may frequently be detected by the observing practitioner, if his inquiries into symptoms be made with sufficient precision, and understood by the patient. On some occasions, however, symptoms having a stricter reference to the functions and site of the liver, may be so masked from the observation of the practitioner, by some concurrent or consecutive disease, as to mislead his judgment altogether. But in proportion as attention is directed to the subject, and experience respecting it ripens, so will such error very rarely occur.

We have stated, that when the liver is actively inflamed, it often becomes

exceedingly large, from previously existing or concomitant congestion; and sometimes it fills the greater part of the superior abdomen, projecting considerably from under the ribs. This is more particularly the case when the superior surface of the liver is the seat of the disease. When the increase of bulk is chiefly in the concave surface of the liver, it extends, as we have already stated, more in the direction of the stomach and colon, and is less evident upon examination. Adhesions are then frequently formed with either the stomach, colon, small intestines, or right kidney; and if the inflammation terminate in suppuration, the abscess generally breaks in some one of these viscera, or even into more than one of them, as will be observed in the details of some of the cases accompanying this section. When the liver becomes enlarged and congested with blood, at the same time that it is inflamed, although the danger of supervening abscess is greatly heightened, yet the enlargement and tumefaction evident in such cases upon examination, are no sign that the abscess already exists, or even that the suppurative process has actually commenced: on the contrary, when abscess actually forms, the diffused tumefaction diminishes, it becomes more concentrated and limited; and at last, unless in the very seat of the tumour, the liver seems, upon examination with the hand, actually lessened in size.

Adhesions to opposite surfaces, we should also remark, are not always the result of the pointing of an abscess in any particular direction. If it form, and point in the superior and anterior surface of the liver, adhesions to the adjoining parietes frequently are the consequence, and then an operation may be performed with a prospect of advantage in many cases. But it may point in various other directions, and break into the large cavities, or into other viscera, according as adhesions may or may not have formed. When the disease is seated in the superior and anterior part of the organ, with tumefaction, the progress of the suppurative process, and the ripening of the abscess for the operation, may then be very closely and accurately observed. But when tumefaction and subsequent abscess take place in the superior and posterior part of the viscus, or in the concave surface, then the extent and progress of disorganisation can but seldom be accurately followed; and we have no precise information as to the extent of mischief, unless the collection

of matter find its way into the lungs, on the one side ; or into some part of the abdominal viscera, on the other.

When abscess points externally, the circumstance may readily be detected ; and in some cases, when it is formed in the body of the liver, and points in the direction of some other important organ, it may be so recognised by the symptoms present, and even, in some few cases, by means of the hand ; counter-pressure on the posterior parts of the lower ribs being made at the time of examination. It should, however, be recollected, that abscess may form and point either upon the diaphragm or upon the abdominal viscera, in broken-down constitutions, phlegmatic temperaments, and scrofulous habits, without any evident symptoms being present by which we may judge either of its progress and course, or even of its existence : indeed, in such individual circumstances, unless the disease assumes a very active character, the formation or existence of abscess is not often evident until it is about to terminate fatally, having induced great disorder of more than one of the digestive and assimilative functions ; and in some cases, if the attention has not been alive to this consequence of disease, it may pass undetected until disclosed by the *post mortem* examination of the case.

When acute attacks of hepatitis are not subdued by sufficiently decisive treatment in their early stages, they run rapidly into abscess. This consequence of the disease is chiefly to be dreaded when considerable enlargement of the viscus is found upon examination. If abscess actually be formed, and is seated in the convex part of the right lobe, the enlargement is evident over the whole hypochondriac region, the liver extending considerably below the ribs towards the umbilicus, and sometimes across the epigastrium to the left side. When the abscess is likely to point below the ribs, there are generally great tumefaction and increased heat of the surface of the part and its vicinity : frequently there is found a distinct enlargement, particularly in the more advanced progress of the abscess, immediately under the margin of the right ribs. If, however, abscess form on the superior surface of the liver, and point upon the diaphragm, although the enlargement of the organ will be very perceptible, yet there will seldom be felt any great increase of

temperature on the surface of the hypochondrium. The abscess may point between the ribs; in this case, a bulging of the false ribs will be observed, and more than usual fulness of the intercostal spaces, and increased heat in this situation, with considerable enlargement, the liver being felt below the right hypochondriac region, in the epigastrium, and sometimes in the left hypochondrium. This enlargement may exist for a considerable time before matter forms; but in this case there will be no distinct tumour nor increase of heat: when the abscess has advanced considerably to maturity, the undefined enlargement and tumefaction become even diminished, and distinct tumour is more observable, according to the situation of the abscess and the direction which it may take.

When the abscess is completely formed, and is seated in the superior and posterior part of the liver, the enlargement and tumefaction felt beneath the ribs, previous to, and during the formation of matter, become considerably diminished; but if it be in the inferior and anterior part of the organ, the enlargement becomes more and more reduced and circumscribed, until it assumes the character of a distinct tumour; and the pain, which was often considerable during the period of general enlargement or tumefaction, either altogether ceases, or is now but little felt. For further observations characterising external pointing of abscess of the liver, we must refer our readers to the section on treatment of abscess, and on the operation for abscess when it points externally.

The supervention of abscess of the liver is often not manifested by symptoms of a decided nature, particularly when it is the consequence of a chronic inflammatory action, complicated with dysentery: in such cases especially, the formation of matter may commence and terminate without the appearance of any of those signs upon which the inexperienced are taught to rely. The presence of rigors can seldom be expected; but slight shudderings and formications are more frequently observed. Even when rigors are complained of, they are not diagnostic of the formation of matter in this disease; for the practitioner must remember, that hepatic disease is often complicated with ague, and the rigors may belong to the febrile paroxysm. Rigors

may proceed also from that state of stomach induced by irritation and spasm of the gall-ducts, and by the irruption of bile into the duodenum. When rigors or horripilations supervene to the more active forms of hepatic disease, then more dependence is to be placed upon them, as characterising the formation of matter in the liver; but it is chiefly by the manner of their supervening to the antecedent symptoms, and by the relation which they bear to the phenomena succeeding them, that we should be guided in our judgment respecting them. The inquiries of a medical man respecting the existence of this particular symptom are not always understood; and amongst the lower classes of the community, the physician should take care to render his meaning perfectly intelligible to his patient in his examination into symptoms. If this injunction be carefully attended to, he will often find that slight rigors have been actually present, although the patient had but a few minutes before denied their existence: and even when they have not been felt, slight shudderings or formications have been perceived.

Sometimes an internal sense of throbbing and fluttering has been felt in the region of the liver, and has been followed by a broad, soft pulse, and night perspirations. The supervention of night perspirations, with a clamminess of the skin of the extremities, is one of the most certain signs of the formation of internal abscess which we possess: but even this ought not to be relied upon alone, but should be viewed always in connexion with the other symptoms characterising the case. The next in importance are frequent cold sweats, but these are chiefly met with in the advanced stage of abscess. Frequent fainting sensations are deserving of considerable reliance on the part of the practitioner. There are also generally much anxiety and oppression at the precordia, and restlessness. If, during the treatment of hepatitis, we find it a matter of difficulty to affect the system with mercury, vascular depletions having been previously practised with the requisite decision, we may then dread the existence of abscess. Whether or no the mercurial remedies employed may act in such cases, owing to peculiarities of constitution or diathesis, in producing and accelerating the suppurative process, is a question not readily admitting of decision; but there can be no doubt that the system will not be brought under the full operation of mercury, or that

ptyalism will not follow upon the most energetic employment of this substance, when abscess exists, although a slight tenderness of the gums will be produced by it. This circumstance has been proved to us on very many occasions.

When abscess is formed, the tongue is seldom or ever of a natural appearance. At first it is sometimes white, and the papillæ raised or excited: it afterwards becomes of a dusky, brick-coloured redness, or what may be called a beef-steak tongue. At other times it is dry, coated, and of a brown tinge. In the more chronic cases, it is often smooth, chapped, lobulated, and apparently deprived of its papillæ. When great mischief is going on in the liver, without any acute symptoms, the tongue is often an excellent guide, and more to be depended upon than the pulse. In many of the less acute or chronic cases of abscess, the tongue has a peculiar white appearance, with the papillæ raised or excited: it is somewhat dry, but without any coating. This is what we have called an excited tongue, because we have considered it a sign of great vascular excitement going forward in internal structures; and we have often ordered depletions from this symptom alone, the tongue becoming natural as soon as a full depletion was performed. Hence we have considered that, when this state of tongue is observed, depletions may be directed more safely than upon the indication of any other symptom. Care should, however, be had not to confound this appearance with a white and moist condition of the tongue, or with a white, yellow, or brown crusted state of this part. The pulse, at the commencement of the formation of matter, is generally soft and full, is subject to acceleration in the evening, and, as the organic change advances, becomes more irritable, quick, and contracted. The stools are always much disordered through the progress of abscess of the liver: they are generally more or less frequent, are scanty, and usually consist of a greenish, watery fluid, with a greenish froth, or a green, slimy scum, floating on their surface. Frequently there are also straining and tenesmus; and some blood, with mucus, is occasionally voided. The calls to stool are also, in many cases, most frequent during the night. In hepatic disease, terminating in abscess, and complicated with dysentery, both the small and large intestines become diseased,—first functionally, and afterwards organically; and the patient generally dies of the organic change produced chiefly in the large

intestines, frequently before the abscess makes its way, either externally or into any other organ. In many cases of hepatitis, complicated with dysentery, more particularly when the hepatitis presents a chronic character, the termination of the inflammation in abscess is accelerated, if it be not altogether produced, by the sudden arrest of the dysenteric disease. In many other cases, as we shall have to shew more fully when hepatic dysentery comes before us, the hepatic disease is not apparent until the dysenteric symptoms are subdued; but although the disorder of the liver was not evident, or did not excite notice, while the bowel disease was urgent, we are not on that account to infer that it did not then exist. On the contrary, we believe that in most of the instances of this description the liver was the original seat of mischief, which only became more severe and more apparent when the consecutive disorder was abated.

In the more advanced stages of abscess, and particularly when it is seated in the posterior part of the liver, and presses upon the diaphragm, anxiety and oppression at the præcordia become urgent. There are often attacks of dyspnœa, and frequently hiccup. There is sometimes also much difficulty of swallowing; and when the abscess points upon the stomach, this symptom is very generally observed, and is often aggravated by the almost constant presence of flatus in the stomach. In cases where the stomach is pressed upon by an abscess, vomiting is a very general symptom; and in the far advanced state of abscess, vomiting occurs without exertion soon after substances are received into the stomach, and occasionally the matters taken are ejected through both the mouth and nose at the same moment.

The easiest position for the patient in abscess of the liver is various. It is most frequently upon the back and upon the left side, when the abscess points towards the stomach or colon. Frequently, the patient experiences most ease from a sitting posture, and leaning gently forwards. Pain is a very uncertain symptom. At the period of tumefaction or enlargement of the organ, which in the more acute cases precedes the formation of matter, the pain is sometimes considerable, and is afterwards converted into a throbbing or beating sensation, accompanied by shooting or darting pains

in various directions, as described under the section on active hepatitis. When, however, abscess is fully formed, a pricking pain is often only felt, and chiefly in the situation where the abscess is pointing. In the more chronic cases, the pain is often not much felt in the region of the liver, and this pricking sensation is the only uneasiness felt in that situation, and sometimes the only notice we receive of the existence of abscess, unless our attention has been particularly directed to the subject. In such cases, however, pain will generally be complained of on sudden motion, on quick respiration or action of the diaphragm, as in sneezing, coughing, &c.

In many of those chronic cases, the patient, even when he experiences pain, attaches but little importance to the circumstance. His countenance, however, evinces disease: it is sallow, sunk, and the eye either of a yellowish tint or of a pearly hue. His tongue is white and excited, the spirits depressed, and sometimes he is even melancholy. These symptoms may go on with but little variation for months; but the patient continues to lose flesh, the pulse is quickened in the evening, and when he comes under treatment, the functions of the bowels are found irregular, being either too much relaxed or too costive. In either case the motions are morbid, and always deficient of healthy bile. The consistence of the alvine dejections is often that of soft clay or putty, and they have a peculiar fœtor. In this state of disease, we may infer that the mischief going forward is not very extensive; but it may not be on that account the less serious: it will only be, in the great majority of cases, the longer in arriving at its issue. When, on the other hand, the symptoms are more acute, when the constitutional derangements are great, the tongue dry and smooth, the fever very considerable, and the functions of the alimentary canal much disturbed, and signs of dysentery present, then immediate danger is to be apprehended.

Abscess of the liver may terminate fatally without opening externally or into any internal cavity, and without communicating with any other organ. When such is the case, death is occasioned chiefly by the constitutional disturbance induced, and the disease of the bowels which supervenes in the last stage. When the abscess breaks internally, it is generally in one of

two ways:—its external surface either becomes inflamed, and throws out coagulable lymph, which produces adhesions to adjoining parts; or no adhesion takes place, either from the absence of inflammation from its external surface, or from the inflammatory action of the part being insufficient for the production of coagulable lymph and the formation of adhesions. When no adhesions are formed, then the abscess breaks into the abdominal cavity, and excites peritoneal inflammation, which rapidly destroys the patient. When adhesions form, the abscess makes its way to other situations, according to the part of the liver in which it is situate, and the direction it may take. Thus it will make its way through the diaphragm into either the thoracic cavity or into the lungs themselves; or it will break into the stomach, or into the colon, or through the medium of the ducts into the duodenum: it may even communicate with the right kidney, and the purulent collection pass off by the urinary apparatus: but this is a rare occurrence.

With respect to the appearance of the liver upon dissection, when it contains one or more abscesses, it is necessary to make a few observations. These appearances, as well as colour of the matters which the abscesses contain, vary very considerably, according to the acuteness of the inflammatory action from which they have proceeded. Upon exposing the liver, it presents various appearances as respects its shape, according to the particular part in which abscess may be seated. When the abscess is in the right lobe, as it generally is, this lobe is always more or less enlarged, according to the extent of the purulent collection. When it is either near the middle of the lobe, or more nearly approaches the superior surface of the viscus, this lobe assumes more or less of a spheroid or globular form, and rises high into the right thorax.* When the abscesses are two or more, the form of the organ is more irregular, according to the parts which they occupy.† The colour of the surface of the organ in cases of abscess is very various: sometimes it is of a pale orange, or of a pale or deep yellow, towards the apex of an abscess which has approached nearly to the surface of the viscus, while the parts towards the base are of a deep reddish brown,

* See Plates III. V. VII. and IX.

† See Plates I. and IV.

or even approaching a blackish hue.* In some cases, the apex of the tumour of the liver is mottled or marbled of various colours.† The surface of the viscus is generally of a deep-brown tint; and in some cases it is of a very dark hue, or marked with deeper-coloured spots.‡ In the more chronic cases, the brown or deep-coloured surface of the liver is studded with minute collections of purulent matter, which seem to have been formed between the substance of the organ and its external covering.¶ In some instances the surface presents a granulated appearance, with a few light-coloured vessels ramified through it.§

The matter contained in an abscess presents various appearances: in some it is a thin, watery pus; in others it is thin, watery, and with thick, curd-like clots floating in it. In many cases it is perfectly purulent, and of varying degrees of consistence. As respects colour, there is also considerable difference: most frequently the matter is of the usual yellow colour. Sometimes it presents a yellowish-brown or sanious tinge, and occasionally a greenish, greenish-brown, or greenish-yellow hue. Sometimes it is watery, and reddish-brown; at other times it is observed of a cream consistence, and nearly white. When the abscess is divided, so as to give a full view of its walls and the substance of the organ surrounding it, the appearances are very different in different cases. In some there seems to be no enveloping cyst beyond the texture of the organ. In these cases the adjoining substance of the viscus is much softened, red, and inflamed; and in a few instances we have observed it broken down, and hanging from the walls of the abscess in shreds.¶¶ In other cases, where no distinct enveloping cyst exists, the surrounding texture of the organ is impacted around the abscess, and as if it were condensed and stretched around it from the distending power of the secreted matter, and the coagulable lymph effused in its immediate vicinity.** The internal surface of the walls of the abscess, in contact with the matter in such cases, possesses a fine cellular texture, approaching to the character of

* See Plates I. III. V. and XII.

† See Plates V. and IX.

‡ See Plate I.

** See Plates VI. and VIII.

† See Plate VII.

¶ See Plates IX. and XVIII.

¶¶ See Plate II.

mucous tissue. In other cases, particularly when the matter is of a curdled appearance, a distinct cyst is found closely attached to the surrounding texture of the liver; and the cyst varies in its characters from a fine smooth membrane, admitting of being peeled from the adjoining tissue with difficulty, to a strong fibrous substance, of a hard gristly texture, nearly approaching the cartilaginous state in some parts. In the cases of abscess supervening to the more active forms of inflammation of the substance of the liver, the parts in the vicinity present more or less of the appearance of inflammation or congestion, and are of a brownish-red or deep brick colour. This greater depth of colour is often attended, also, with a change in the consistence of the texture. Sometimes it is softer and more friable than natural, at other times more dense and firm. In many cases the substance of the organ generally presents but few signs of increased vascularity or redness, until the immediate vicinity of the abscess is approached, when a zone of a deeper tinge, which becomes deeper still, the nearer to the purulent collection, surrounds the section of the abscess. In other cases, evidently of a slower and more chronic kind, little or no inflammation is observed in the vicinity of the abscess, excepting in the inner surface of the cyst, if there be one, or of the substance of the viscus in which the matter is contained.* In other chronic cases, the substance of the liver is but little changed in colour from the natural hue, being only of a somewhat deeper tint and firmer consistence; but when divided by means of a very sharp scalpel, several small abscesses, similar to those we have already described as being sometimes seen on the surface of the organ, are found scattered throughout its substance, and containing a thick purulent fluid, varying from the consistence of thick cream to that of soft cheese. In these cases, the existence of a cyst or cysts is by no means evident; and the purulent matter seems to have been deposited in the substance of the organ, and to have had its more watery particles afterwards absorbed, thus leaving the cavities in which it was deposited imperfectly filled by the remaining more consistent matter.†

It is not unusual to find, upon dissection, parts of the liver ulcerated; but we do not recollect of meeting with a single case of this description which

* See Plate IV.

† See Plate XVIII. Fig. 2.

had not been preceded by either abscess, or by adhesions to adjoining parts. When an abscess forms in the superior part of the liver, and, by means of adhesions, finds its way into the lungs, and is emptied by expectoration, ulceration of the cavity in the liver from which the purulent matter issued, is sometimes remarked.* When coagulable lymph is thrown out from an inflamed part of the liver, so as to give rise to adhesions between it and an organ or surface opposite to it, ulceration may supervene in the parts thus connected. Adhesions formed in this way between the liver and colon occasionally ulcerate, the ulceration extending into the substance of the liver. When abscess bursts into the colon, ulceration of the parts of the liver adjoining the abscess has sometimes supervened, and precluded every chance the patient may have had of recovery. In a case where the inferior edge of the liver was adherent to the right kidney, an ulcerated cavity existed in the liver at the place of the adhesion.† Similar instances to the above have occurred to us in practice: but these we have noticed are sufficient to illustrate the subject.

CASE LXXX.—*Abscesses of the Liver, with Constrictions of the Bowels. — Examination post Mortem. — (See Plates I. and II.)*

WILLIAM BEDLOW has been in hospital nearly two months, with inflammation of the liver and morbid secretion of bile, and has been treated by means of active depletions and purgatives, with saline diaphoretics, without any permanent benefit: his strength is much reduced, and he still complains of great uneasiness. There is a peculiar dryness of the tongue, which is sometimes covered with a thick crust of yellow mucus; and at other times the tongue is of a dark-red colour, but always dry. Pulse not much quickened, never higher than 84, but generally 72. Alvine discharges, till lately, were a straw-coloured mucus, mixed with feculent matter, and sometimes blood; but latterly they have become more marked with bile, and of better consistence. He has been taking for some time the nitric acid.—R Pilul. hydr. ʒj.; calom. ʒj.; pulv. ipecac. ʒss.; syr. q. s. Ft. pilul. xx.; capiat unam mane nocteque. Mist. amar. et sennâ, cum tinct. ferri muriat. et tinct. sennæ, bis quotidie. Frictiones mercuriales.

January 1st.—Has passed a very bad night, in consequence of pains over his body,

* Plate XI. shews this occurrence, as it is observed in dissections.

† See Plate XVII. Fig. 3.

but he has no pain in his belly or chest; perspires very much in the face, but not on his body; pulse 74, full, soft, and natural; feels some difficulty in swallowing, as if the passage were narrowed, and oppression on his chest; tongue of a dry and red appearance; stools changing to a paler colour. — Repet. acid. nitros. et pilul. ut olim. Repet. haust. et frictio. Milk-whey; shampooing.

2d. — Stools the same as yesterday morning; tongue much moister, and appearing more natural; skin of a natural temperature; pulse 70 in a minute. — Cont. pilul. ut antea. Repet. haust. et frictio. The shampooing and the milk-whey as before.

3d. — Stools copious, of a bluish-clay colour and consistence; tongue cleaner and more natural. — Cont. omnia.

4th. — Stools morbid and feculent, but of a blue-clay colour and semi-fluid consistence; tongue as yesterday; has felt a pricking pain in the night under the right ribs, which is increased when he moves or lays on his right side; it extends to the shoulder-blade: we cannot feel any hardness or enlargement in the region of the liver; but when we press upon it, he complains of great pain. — Apply sixteen leeches to the part affected. — Cont. frictio et medicina, ut antea.

Evening. — Stools very copious, but pale-coloured; pain relieved in a very slight degree only. — Apply sixteen more leeches. Haust. anodyn. h. s. s.

5th. — Has found great relief from the application of the leeches; his tongue is cleaner and moister; his stools, for the first time since he has been in hospital, have a natural appearance; pulse distinct, and 66; has still some pain, which shoots through his shoulder-blade and collar-bone. — Cont. med. Haust. anodyn. h. s. Sago and wine.

6th. — Pulse the same as yesterday; tongue rather drier; stools changed to a pale brown; skin cool and natural. — Repet. med. ut antea. Whey, &c.

7th. — Pulse 72, rather languid, and weak; he perspired a good deal in the night; tongue moister; has passed some blood (a pint) in his stools, with green, feculent matter; has some aching pain in his belly, and general tumefaction; skin natural and cool. — Cont. pilul. ut antea. Repet. mist. amar. cum tinct. ferri muriat. ℥xxx. Sago, wine, and whey.

8th. — Stools green, curdled, and feculent; tongue more natural, not at all furred; pulse 72 in a minute; slept well. — Cont. omnia. Enema emolliens.

Evening. — Has vomited a good deal, and is amazingly reduced; his pulse is small and weak; skin moderately warm; has had a full perspiration; stools offensive, and of a pale-straw colour; no pains. — Haust. amar. cum tinct. opii, ℥l. Warm wine, ℥iij.

9th. — Pulse 76 in a minute; tongue perfectly healthy and natural; skin agreeably

cool; stools a green, curdled, feculent matter, with some pure blood and glairy mucus from the rectum; he is very weak, and complains of fainting sensations; feels pain under the right ribs and across his breast; spirits much depressed.—*R* Infus. amar. cum sennâ, ℥jss.; aquæ ammon. ℥xx.; ol. anisi, ℥iij. *M.* statim sumendus. Enema emolliens at twelve o'clock. Warm wine, ℥iij. Whey and sago as before.

Evening.—Stools green and feculent, with some pure blood, as in the morning, only more copious; pulse 88; feels rather better; had no fainting fit.—*Haust.* anodyn. h. s. s. *Repet.* enema emolliens.

10th.—Stools more natural than they have ever been; tongue clean and moist; no fur at all; pulse languid and small, 74; much weaker than ever; the pain he complained of in his side and breast rather less; appetite indifferent.—*Repet.* mist. amar. cum sennâ, ℥ij. stat. sumend. *Repet.* acid. nitros, ut antea. Wine, sago, and whey. Pudding.

Evening.—Stools quite feculent, but there is some pure blood and mucus; pulse better; has pain in his shoulder.—*Rub* his shoulder with liniment. volat. *Haust.* anodyn. h. s. s. *Cont.* frictio.

11th.—Pulse 84; stools are the same as yesterday, feculent and curdled, of a green colour, like a child's; his tongue is cleaner; skin cool; has passed a very bad night, and has suffered a great deal from pain in his shoulder and loins.—*Haust.* amar. *Omit.* pilul. *Cont.* frictio. *Diæta* ut antea. Pudding.

Evening.—Stools copious, and perfectly natural; tongue quite clean, but rather dry, and smoother than usual; he feels a general soreness throughout the whole abdominal viscera, but no distinct pain. We fear there is chronic abscess of the liver, which is beyond the power of medicine to remove.—*Haust.* anodyn. h. s. s. *Cont.* frictio.

12th.—Feels very weak; his stools are natural; pulse getting much smaller and weaker; tongue moist this morning, and clean, but he certainly gets weaker every day.—*R* Decoct. cort. ℥bj.; tinct. ejusdem, ℥j. *Tinct.* ferri muriat. 3j. *M.*; a wine-glassful three times a day. *Omit* the mercurial frictions. The opiate liniment, ℥iij. cum tinct. opii, 3j.

13th.—Purged a good deal; stools of a paler colour, and more watery; tongue as before, clean and moist; pulse smaller and weaker.—*Repet.* cort. cum tinct. opii. *Cont.* liniment. opiat.

Evening.—Stools perfectly natural; tongue dry; pulse exceedingly weak, scarcely to be felt; skin cold, and a cold, clammy sweat over his face; he is nearly exhausted.

R Tinct. opii camph. ʒij. Aquæ ammon. mxxx. Spirit. lavend. comp. ʒj. Aquæ puræ, ʒjss. M. ft. haust. stat. sumend.

14th.—Countenance a good deal changed; pulse hardly to be felt; skin cool; was not disturbed in the night; feels easy, but is fast sinking; the pain or soreness all over him is better this morning.—Repet. haust. anodyn. stat. sumend.

15th.—Died at about half-past six o'clock in the morning.

Sectio Cadaveris, two hours after Death.—The liver was greatly enlarged, descending to the right iliac region, and filling the whole epigastric and right and left hypochondriac regions; the right lobe of a mottled, spotted, and dark copper colour; the left marked with pale, radiated stripes. (See Plate I.) The stomach was at first not visible, and but a small portion of the colon. The former was smaller than usual, and its coats thickened. In the left side, the small intestines were of a peculiar pale, pearl colour, and so transparent that the contents were visible through their coats. The ilium, in separate parts throughout its course, was thickened and contracted; and there was a marked appearance of venous congestion, of a purple colour, in those parts. There were also other portions of the same gut inflated, and so perfectly transparent that the fæces could be seen through its coats. This gut became peculiarly thickened as it entered into the cæcum. The jejunum was of a bluish colour, much thickened in its coats and contracted, and full of pultaceous matter. This appearance extended to the duodenum. The cæcum was unusually small, and the whole of the colon, to the sigmoid flexure, was contracted to two inches in circumference. About the sigmoid flexure it retained its natural size. The rectum was also contracted throughout. The bladder was full of urine.

On removing the liver, to examine the stomach, two abscesses were found in the concave part, one in each lobe, which discharged a considerable quantity of well-digested pus. The liver was removed, and when divided longitudinally, as shewn in Plate II., the substance of the organ was found greatly inflamed, softened, and its tissue adjoining the purulent accumulations, hanging in shreds amid the purulent fluid.

Remarks.—The state of the tongue and of the evacuations, the difficulty of swallowing, pricking pain, abdominal tumefaction and soreness, were here sufficiently indicative of the extent of mischief existing in the liver.

CASE LXXXI.—*Abscesses of the Liver,—one communicating with the Ducts,—and singular Course of the Colon, &c.—(See Plates III., IV., and XVII. fig. 4.)*

PATRICK HAND has been in hospital some time, with symptoms of dysentery, accompanied with a morbid state of the biliary secretions, and obscure affection of the liver: has been well purged, and has taken mercurials with great benefit; he is now convalescent, and takes the saline mixture.—Pilul. hydrarg. cum calom. et pulv. antim. nocte maneque. Mist. amar. cum sennâ, pro re natâ.

January 1st.—Tongue quite clean and healthy; stools small and natural; no pain at all; pulse good; strength improving.—Cont. med. ut antea.

14th.—Stools small and scanty, but feculent; tongue healthy.—Ol. ricini, ℥ij. statim. Calom. gr. xij.; pulv. antim. gr. vj.; syr. q. s. Ft. pilul. h. s. s.

5th.—Feels very sick, and has a bitter taste in his mouth; tongue clean; pulse good; is annoyed by the jolting of the dooly; he has been well purged; pulse fuller and quicker.—Rub ʒj. unguent. hydrarg. on his belly and stomach. Repet. pilul. hydrarg. ut antea, et haust. amar. cum sennâ.

6th, 7th, 8th, 9th, and 10th.—Stools perfectly natural; tongue cleaner; no pain; pulse good.—Cont. pilul. et haust. amar. cum sennâ, ut antea. Mist. salin. febrif.

10th. *Evening.*—No complaint but weakness; stools natural.—R Decoct. cort. Per. ℔j.; acid. sulph. mxxx. M. ft. mist.; a wine-glassful every four hours. R Acid. nitros. ʒj.; aquæ puræ, ℔j. M.; a glassful two or three times a day.

11th, 12th, 13th, 14th, and 15th.—Has no complaint but weakness.—Cont. cort. Per. et acid. ut antea. Three glasses of punch. Fowl diet. Exercise evening and morning in a dooly.

16th.—Stools of a greenish colour, feculent, with some pure blood.—Pulv. purg. Cont. pilul. ut antea. Enema emolliens.

Evening.—Stools highly bilious and of a green colour, with much mucus; pulse small and quick; no appetite; no pain of any kind, but very weak; tongue dry.—Calom. gr. xij.

17th.—Stools pure bile, with some white mucus; tongue again furred; pulse better; no pain at all about his belly.—Pulv. purg. Cont. pilul. et enema emolliens. Milk and rice for breakfast and supper; sago for dinner.

Evening.—Stools less bilious and more feculent; no pain; pulse weak.—Haust. anodyn. h. s. s.

18th.—Stools more feculent and natural, but not copious; passed a very good night, and was only once disturbed; has now pain over the whole abdomen on pressure, particularly in the right and left hypochondrium and the course of the colon, and about

the umbilicus; tongue dry, and somewhat brown; his mouth is not sore, though he has rubbed in for eight days, and has also taken the blue-pill, with calomel and the pulv. antim.; pulse small and weak. — Rub in a drachm of unguent. mercur., with six grains of camphor, and a drachm of white ointment, three times a day. Pilul. hydr. cum calom. et pulv. antim. three times a day. Mist. amar. cum sennâ, ℥ij. nocte manequ. Enema purgans.

19th.—Tongue of a brown colour, thickly furred; stools highly bilious, like pure, cystic bile; has complained of pain and soreness in his belly, but he only feels it when the ointment is rubbed in; his gums are getting tender.—Pulv. purg. Cont. frictio, ut antea. Mist diaph. Mist. purg. ℥ij. cum magnes. sulphat. ℥ss. horâ tertiâ post meridiem.

Evening.—Stools pure, green bile, with some feculent matter; his tongue still furred; is exceedingly weak; pulse quick and trembling, 120 in a minute; was vomited, and threw up some green matter like verdigrise; skin hot.—R Mist. salin. febrif. ℔j.; spirit. æther. nitros. ℥ss.; vin. antim. ℥jv. M.; a wine-glassful every hour. Submur. hydrarg. gr. xij., et haust. anodyn. h. s. s.

20th.—Stools more feculent; water of a higher colour; pulse small and weak; skin warm; has still soreness when he is rubbed, but there is no fulness or tension; he appears to lose ground fast; countenance much altered.—Mist. amar. cum sennâ, ℥j.; magnes. sulph. ℥ij. M.; immediately, and to be repeated at ten or eleven o'clock. Continue the mist. salin. febrif. and pills, as before. Haust. anodyn. h. s. Sago and wine.

21st.—His stools are feculent, without blood; his pulse is hardly to be felt; skin cold; he is sinking fast.—Æther, with ammonia. Wine and sago.

Died in the afternoon.

Examination, two hours and a half after Death.—The liver was considerably enlarged, of a pale colour in some parts, and darker in others; and a large abscess had formed upon the convex surface of the right lobe, with strong adhesions to the diaphragm, and pointing towards the thorax. The left lobe also contained a small abscess. (See Plates III., IV., and XVII. fig. 4.) There was no apparent inflammation of the substance of the liver, excepting in the cellular tissue surrounding the purulent collections. The stomach was pressed out of its situation, and descended in a straight line down to the umbilicus, where it made a short turn upwards, between the right and left lobes of the liver, and then made a sudden turn again to the left, under the gall-bladder, where the pylorus, duodenum, pancreas, gall-bladder, and ducts, were united together by means of cellular adhesions to the abscess in the concave surface of the liver, and, indeed, formed part of its cyst. The coats of the gall-bladder were much thickened.

This viscus was very small, and seemed to be divided by a stricture in the centre. The colon was at first not visible, and the whole of the small intestines were thickened and contracted, and in many parts had the appearance of recent inflammation. The omentum was flaccid, but not much altered in appearance. Upon removing the small intestines, in order to examine the course and condition of the colon, the following singular position of this intestine was discovered. The cæcum was firmly placed upon the side of the lumbar vertebræ, and the colon thence took a circular sweep under the right lobe of the liver, as far as the epigastrium, where it made a short but complete fold or twist, and again took a circular direction under the left hypochondrium, across the umbilical region, until it nearly approached the cæcum, where it again formed a complete fold or twist, passed over the cæcum, rose into the right hypochondrium, near to, and to the right of, the spine, and then made a sharp turn downwards and still further to the right, and assumed the sigmoid form in the right iliac region. It thus, by its second twist, and its direction upwards into the right hypochondrium and downwards again to the right iliac region, passed over the cæcum and concealed it from view. When laid open, the colon presented no marked appearances of disease in its internal membrane, although the numerous twists in the position of the organ must have tended to retard the course of the contents through it. (See an Engraving of this position of the colon, which must have been owing to original formation, in the Second Volume of the Work.)

CASE LXXXII.—*Abscess of the Liver on Admission, Diseased Bowels, &c.—Examination.*

LIEUT. ———, His Majesty's 59th Regiment, was reported sick on the 17th December, 1815, at Calcutta. His stomach rejects every thing he swallows, and his system cannot be brought under the influence of mercury. There seems to be some pressure on the stomach, either by enlargement or suppuration of the liver. Pain had been previously experienced in the side, extending to the shoulder and across the belly; but it was removed in a great measure by leeches and a blister. The vomiting now complained of takes place without exertion, and fluids are ejected nearly unchanged. There is sometimes a good deal of green, watery matter thrown up. The bowels are open; the pulse and skin almost in a natural state; strength of course decreasing; he has hiccup; change of position gives pain; reclining on the back is the easiest posture. He has complained for several months of pain in his chest and cough, and for some weeks he has been out of order in his bowels; but being seldom sick, he was very averse to laying up. At first he used strong purgatives freely, and afterwards laxatives;

but making light of his complaints, he did not pay that attention to regimen which was necessary, and it is to be feared that he used port wine freely. He died on the 26th. The mercury never produced the desired effect. He had been delirious for two or three days. There had been for some time an undefined swelling below the pit of the stomach, and there remained not a doubt of a large abscess having been formed in the liver.

Examination after Death.—On opening the abdomen, a large quantity of bloody-looking, fetid fluid was found in the cavity of the abdomen. The whole of the small intestines were of a dark-red colour; also the omentum and mesentery. The liver occupied the whole epigastric and part of left hypochondriac regions, and was of great size, adhering nearly to all the surrounding parts, and very firmly to the right side, from the fifth and sixth ribs to the lower false ribs, and pressing upon the diaphragm. On attempting to raise it from its position, a vast quantity of matter issued from the right lobe, probably to the amount of a pint, the whole lobe being converted into pus, of partly greenish and partly liverish-coloured matter. Marks of inflammation extended to the diaphragm and to the lungs, on the right side. The left lobe of the liver bore every mark of inflammation, being of a dark-red colour, containing extravasated blood, small vomicæ, and a kind of cheesy tubercle, of a most uncommon appearance. The heart was large and flabby, and the pericordium contained a large quantity of a blackish fluid. The gall-bladder was greatly distended, with ropy bile, of a bottle-green colour. The whole intestinal tube bore marks of disease. The inner coats, in some places, were destroyed by ulceration.

Remarks.—This case did not come under treatment until abscess had formed; and it furnishes a distressing instance of the consequence of making light of ailments, and concealing the existence of disease,—a practice but too common amongst young officers in India.

CASE LXXXIII. — *Abscess of the Liver opening into the Lungs, with great Enlargement, and morbid Changes in the Bowels.*—*Examination.* (Plate XI.)

RICHARD MORRIS, arrived from Hyderabad on the 27th December, and admitted at Kurnool. He had been long ill, and at the time of his admission complained of bloody and purulent expectoration, and oppression at the chest; pulse 120; bowels regular and stools natural; cough considerable, with difficult but copious expectoration, but he felt no pain in his side; he cannot recline upon his back from a sense of suffocation.—Leeches were applied to the chest, and anodynes and demulcents,

with digitalis, were given. There were no hopes of his recovery at the time of his admission, and he died five days afterwards.

Sectio Cadaveris.—The liver was amazingly enlarged, and filled the whole right and left hypochondriac, epigastric, and a great part of the umbilical region. Its surface was studded with minute, yellowish spots, and was marked over the whole surface with depressions formed by the ribs. The gall-bladder was full of yellow bile, and the whole of the small intestines had a watery, leucophlegmatic appearance. The stomach was pressed down out of its natural situation, and was of a pale colour, much thickened in its coats, and uncommonly small. About eight or nine ounces of serum were found in the pericardium. There was no adhesion of the lungs at all to the ribs. The substance of the lungs appeared soft, and were mottled blue and white. On removing the lungs to examine their state, a large abscess was discovered in the posterior part, connected with the liver. The abscess contained near two or three quarts of pus, and the whole of the superior convex part of the liver was a complete bag of matter. The substance of the liver was tender and soft; the surface of the cavity of the abscess was ulcerated, and tore on the slightest pressure of the fingers. The colon was contracted, and the mesenteric glands enlarged, white, and very hard. The descending colon and rectum, also, were contracted to one half their usual size, and the sigmoid flexure formed a kind of stricture in the left iliac region before it left the pelvis. The small intestines were unusually small, with a great deal of venous congestion. Stomach was much lengthened, and smaller than it should be, and had the appearance of a part of the colon. No particular appearance in the heart.

Remarks.—This man, upon the march from Hyderabad, was seized with a most violent, bloody, and purulent expectoration; and upon notice having been given us of the circumstance, he was removed into Kurnool, where we were then stationed, when he came under our care. Although he brought no account of his case, there was no doubt of his having been long and seriously ailing previous to his departure from Hyderabad: indeed, the appearances on dissection, as well as his state upon admission, were sufficient proofs of the fact. The circumstance which chiefly deserves notice, as not having been recognised during the very few days he was under our care, are the morbid changes detected, upon examination, in the alimentary canal. The regular state of his bowels and natural condition of the stools, gave us no suspicion of disease existing in this situation; and, probably, the change found in the bowels was more the result of previous disease than of recently supervening disorder. This patient complained of no pain or uneasiness, unless when he lay on his back, when the sense of suffocation became most distressing,—a symptom explained by the *post mortem* examination.

CASE LXXXIV.—*Abscess of the Liver, Diseased Bowels, &c.—Examination post Mortem.*
(See Plate XII.)

JAMES LYNCH, aged 27. He at first complained (June 4th) of constipation and pain in the bowels of some days' standing. Ten grains of calomel at night and a cathartic powder in the morning, followed by a purging enema, were administered with very little effect. He then complained of pain and fulness in the lower part of the belly, for which twenty leeches were applied. The calomel and cathartic powder were repeated, and produced some green, tenacious stools. These medicines were continued night and morning till the 11th. He then complained of pain in the right hypochondrium, great thirst, and anxiety. Twenty leeches were again applied, and saline purgatives were given with good effect. A large blister was applied to the right side. Calomel at night and purging medicines in the morning were continued till the 13th. More leeches were then applied to the side over the head of the colon, where the pain had become violent.

He being feverish, the saline mixture was given and the purgatives continued. The pulse was not much increased beyond its natural state; the tongue continued foul and the stools morbid. All the medicines were continued till the 21st, when the pain about the head of the colon considerably increased. He had some cough, and felt pain in the right hypochondrium, but not increased by pressure. Twenty-four leeches more were applied to the right hypochondrium and cæcum with advantage; and purgatives were continued till the 23d. He had then much recovered, and had no complaint but debility.

Decoction of cinchona and sulphuric acid were administered, but they produced so much thirst and general uneasiness that they were necessarily discontinued. The purgatives were repeated and continued till the 25th. Nitric acid and a purgative occasionally were then administered. On the 28th, twenty more leeches were applied to the side, in consequence of the return of pain in the right hypochondrium and region of the cæcum; and the acid was continued with good effect till the end of the month, when the stools became perfectly natural.

The pulse is now 84; tongue clean; appetite pretty good; stools natural; he still feels a dull pain about the head of the colon.—Habeat olei ricini, \bar{z} j. stat. Adhibeatur parti dolenti emplastrum lyttæ. Mist. amar. cum sennâ, \bar{z} ij.

2d.—Tongue moist, clean at the apex, foul at the base; stools natural; the blistered surface has risen very well; pain about the colon unabated.—Repet. mist. amar. cum sennâ. Habeat pilul. hydr. no. 1. vespere maneque. Habeat haust. anodyn. horâ somni.

3d. — Skin cool; tongue clean and moist; one stool perfectly natural; he thinks himself better. — Repet. pilul. hydr. meredie. R Medicaminis Cheltenham water nominati, ℥j.; ol. menth. piperitæ, ℥iij. Sit haust. stat. sumend. Repet. pilul. vespere maneque.

4th. — Two natural stools from the medicine; pulse 90; skin moist, tongue clean, dry; the pain continues; the ulcer from the blister is not healed. — Repet. medicamenta omnia. Haust. anod. h. s.

5th. — He passed the night comfortably; respiration not impeded; can take a full inspiration without uneasiness; pulse 90; tongue clean, rather dry; stools feculent, scybalous; he thinks himself better. — Habeat Cheltenham water, ℥j. Repet. haust. anodyn.

6th. — Pulse 90; skin moist; tongue dry; appetite as formerly; no thirst; stools copious, watery, somewhat feculent; the pain is much abated. — Repet. mist. amar. cum sennâ stat. et h. s. Descendat in balneum tepidum.

7th. — He was much relieved by the bath, and passed the night comfortably; pulse 96, rather hard; tongue clean and moister; one stool. — Repet. mist. amar. cum sennâ stat. et h. s. Descendat in balneum tepidum.

8th. — He was uncomfortable during the night, and had frequent evacuations; pulse 90; skin moist and warm; tongue clean; he complains of having been distended with flatus in the night, but there is no tumefaction this morning. — Habeat pulv. purg. Adhibeatur enema purg.

Vespere. — He feels very weak after the purgatives, which operated freely; pulse frequent; skin warm; tongue clean; stools feculent, tenacious. — R Decoct. cinchon. ℥j.; acid. sulphur. dilut. ℥xx. Sint. haust. ℥ij., tertiâ quâque horâ sumendi. Habeat haust. anodyn. horâ somni.

9th. — He passed the night well; tongue clean, moist, except at the base, which is still foul and crusted; stools frequent; he is at present comfortable; the bark makes him thirsty. — Repet. haust. anodyn. Cont. haust. è cinchonâ.

10th. — The pain of the side is very inconsiderable; stools perfectly natural; tongue cleaner than it has yet been, but with a peculiar smooth, shining appearance, which we consider a mark of organic change of the liver. — Cont. haust. è cinchonâ.

11th. — Skin covered with profuse sweat; tongue clean, moist, smooth, &c.; appetite good; some thirst; bowels regular. — Cont. haust. è cinchonâ.

Vespere. — Pulse frequent; skin hot; tongue clean; the bark makes him thirsty. — Omit. haust. è cinchonâ. Habeat vini cyathum stat.

12th. *Vespere.* — Stools natural. — Habeat haust. anodyn. horâ somni.

13th. — Pulse small, very frequent; skin warm; tongue clean, still parched, and the voice is affected from a deficiency of saliva; stools natural; he is free from pain, but does not seem to improve. — Bibat aquam acidulam succo citrino factam.

Vespere. — He is no better. — Omit. aqua acidula. Bibat vinum rubrum Lusitanicum aquâ dilutum.

14th. — Pulse small, tremulous; skin moist, warm; tongue furred; mouth very dry; thirst excessive; stools liquid, of a natural colour; no pain; he seems to be rapidly sinking. — Cont. potus ex aquâ et vino. He died about five o'clock.

Examination about two hours afterwards. — The liver was greatly enlarged, and excavated by an abscess which occupied the right lobe at its extremity, and which was concealed under the right ribs, to which it had formed partial adhesions. The abscess contained about three quarts of white pus. (See Plate XII.) The vessels of the omentum were filled with blood. The stomach was much enlarged, of a paler colour than usual, and contained a quantity of black fluid. The termination of the ilium at the head of the colon was somewhat ulcerated. The coats of the great intestine, from the cæcum to the rectum, were much ulcerated, and were deeply eroded by sloughing ulcers. The colon was for the most part as thin as paper, but at its commencement at the cæcum it was completely converted into a hard, cartilaginous mass.* There was no appearance of disease in the chest, except that the right lung firmly adhered to the ribs.

Remarks. — Although the state of the tongue in this case led us to consider that abscess had formed in the liver, yet its situation was not apparent to us until examination after death. There was no fulness or enlargement sensible under the ribs or in the epigastrium; and the respiration was perfectly free. Had we been fully aware of the relations of this abscess, we would have made an incision between the ribs, and given vent to its contents. In this case an operation might have been useful, had not disease of the colon precluded all hopes of a favourable issue. The particular sullenness of this man's disposition was found to be a great impediment to our obtaining any satisfactory information of the state of his symptoms and progress of the case. In almost every case of abscess, the exhibition of bark is productive of increase of fever and thirst: and this effect of the remedy in the present case, along with the state of the tongue, convinced us of the existence of matter in the liver: as soon, however, as a free exit is given to the matter, the exhibition of bark, with acids, is often serviceable.

* See a Drawing of this Intestine, in the Second Volume.

CASE LXXXV. — *Abscess of the Liver, Dysentery, Inflammation, and Gangrene of the large Intestines.* — (See Plates V. and VI.)

JAMES DONELLY, ætat. 26, recruit, admitted December 17, 1816, at Kurnool; arrived from England in July. Complains of much purging; passes blood; tongue white; pulse quick and small; has a bitter taste in the mouth; a heavy, dull pain in the bowels; vertigo. — Appl. parti abdom. dolenti hirud. xvij. ; postea adhib. emet. stat. Submur. hydrarg. gr. xx. h. s.

18th. — Stools watery and yellow, with some blood; pulse small and quick; has much straining; no giddiness; no pain in the bowels. — Haust. cathart. Enema purg. Hydrarg. submur. ʒj. h. s. s.

19th. — Stools watery and black, with some blood; tongue whitish; pulse small. — Repet. haust. cathart. et enema purg.

Vespere. — Complains of a pain and soreness in the bowels; stools watery and black, with some blood; tongue whitish; pulse quick and full; skin hot and dry; no straining. — Appl. abdom. hirud. xv. Submur. hydrarg. ʒj. ; pulv. ipecac. comp. ʒj. horâ somni.

20th. — Has no soreness in the bowels; stools consist of a little blood and mucus; tongue white; pulse small and frequent; slept very well. — Repet. haust. cathart. Habeat vespere haust. amar. R Pilul. hydrarg. gr. xv. ; submur. hydrarg. gr. ij. Ft. pilul. h. s. s.

21st. — Much tormina and tenesmus last night; tongue white; pulse quick; stools yellow and feculent. — Repet. haust. cathart. et enema purg.

Vespere. — Tenesmus abated; stools watery and brownish; tongue whitish; pulse small, rather quick. — Repet. pulv. cum submur. hydrarg. ac ipecac. h. s.

22d. — Stools yellow, mucous; pulse very small and weak; tongue white; much straining. — Appl. parti abdom. dolenti hirud. xvj. ; posteaquàm, emplast. lyttæ ampl. Repet. haust. cathart. et enema purg. Hydrarg. submur. ʒj. h. s.

23d. — Feels easier; stools watery, and red with blood; tongue cleaner; straining less; pulse very feeble; skin cool. — Repet. haust. cathart. et enema purg. Hydrarg. submur. ʒj. h. s. Cont. mist. salin. cum spirit. ammon. ʒij. Diæta sago.

24th. — Stools feculent, yellow, mucous, and coloured with a few drops of blood; tormina this morning; tongue dry, but cleaner; pulse rather quick and full; skin hot and dry. — Haust. cathart. stat. Cont. mist. Capiat submur. hydrarg. ʒj. h. s., et injiciatur enema anodyn.

25th. — Feels much better; stools yellow, watery; straining less; pulse rather

hard and quick ; tongue white and parched ; skin hot and dry. — Repet. haust. cathart. et enema purg. Cont. mist. Habeat submur. hydrarg. \mathfrak{z} j. h. s., et enema anodyn.

26th. — Tongue whitish and dry ; pulse rather hard and quick ; stools water and blood : skin cool. — Appl. abdom. emplast. lyttæ. Utatur fritione cum unguent. hydrarg. camph. Repet. haust. cathart. cum sulph. magnes. \mathfrak{z} ss. Repet. enema purg. R Submur. hydrarg. gr. xv. ; pulv. antim. gr. jv. Ft. pilul. vespere sumendæ. Repet. enema purg.

27th. — Slept very well ; tongue white and dry ; stools copious, black, and watery ; pulse 120, rather hard ; skin dry and hot. — Appl. abdom. hirud. xjv. Repet. haust. cathart. cum sulph. magnes. \mathfrak{z} ss. Capiat meridie haust. seq. et repet. h. s. R Spirit. ammon. ; spirit. lavend. compos. $\mathfrak{a}\mathfrak{a}$ mxxx ; aquæ puræ, \mathfrak{z} j. M.

28th. — Tongue parched, dark-brown ; pulse 88, fuller, and stronger ; skin cool and dry ; mouth rather sore ; stools watery, dark-green. — Habeat haust. amar. Repet. enema purg. Submur. hydrarg. \mathfrak{z} j. h. s., et contin. mist. salin. cum spirit. ammon.

29th. — Pulse 84, weak ; tongue dry ; was purged copiously in the night ; stools watery ; has no straining or pain, nor pain on examining his abdomen ; skin hot. — R Pil. hydrarg. \mathfrak{z} j. ; calom. gr. xx. ; pulv. ipecac. \mathfrak{z} ss. ; opii, gr. x. ; syr. q. s. Ft. pilul. xx. ; one to be taken three times a day. Injiciatur enema ipecac. statim et meridie. R Mist. salin. febrif. \mathfrak{lb} j. ; vin. antim. \mathfrak{z} ss. ; spirit. æther. nitros. \mathfrak{z} ss. M. ; a wine-glassful every two or three hours. Pulv. Doveri, gr. xv. h. s.

30th. — Tongue dry and furred ; skin natural ; stools dark ; has pain from the blister only ; pulse 82 ; complains of having had a disturbed night, and cold sweats this morning ; no sickness at stomach ; stools offensive. — Cont. pilul. et mist. Repet. enema ipecac. ut antea. Pulv. Doveri, gr. xvij. h. s. Enema purg. primo mane. Sponge his body with vinegar and water, and put him in the warm bath at night. Afterwards apply a blister to the abdomen. Sago diet and wine whey.

31st. — Pulse 92 ; skin cool and moist ; tongue furred ; no pain in his belly on pressure ; stools still bloody ; has perspired considerably during the night. — Repet. pilul., mist., et enema. Inung. \mathfrak{z} j. unguent. mercur. bis die. Pulv. Doveri, h. s.

January 1st. — Had some sleep ; sweated much in the night ; pulse 90, small, and weak ; tongue cleaner and moister ; feels pain in the right and left iliac regions ; much pain externally around the umbilicus from the blister ; stools bloody, no fæces, no tenesmus. — Cont. mist. salin. Cont. pilul. ut antea, et frictio mercur. Injiciatur enema ipecac. Hydr. submur. \mathfrak{z} j. h. s. Repet. enema h. s. Diæta, sago et thea.

2d. — Tongue still dry, but cleaner, the yellow crust being completely removed ; stools scanty, still bloody, very offensive ; pulse 98, small, feeble ; skin covered with a

clammy sweat; no pain in the belly; no straining; great drowsiness.—Habeat ol. ricini, ℥j. Repet. enema stat. et h. s. Cont. pilul. et frictio. R Decoct. cinchon. ℔j. ; acid. sulph. ℥xx. Ft. mist., cujus habeat cyathum vinosum secundâ vel tertiâ quâque horâ.

3d.—Debility continues; pulse 102, small, firm; skin covered with a profuse sweat; tongue perfectly clean, of a healthy appearance; belly but slightly painful; stools unaltered.—Cont. frictio et decoct. cinchon. cum acid. nitros. Repet. pilul. et enema.

Vespere.—Skin covered with cold sweat; tongue clean; stools bloody, exceedingly offensive; pulse small, frequent.—Cont. med. Exhibiantur haust. anodyn., sago, et vinum.

He sank rapidly from this time, and died on the 4th.

Examination of the Body, two hours after Death.—The omentum, a complete cake of fat, enveloped the colon and part of the small intestines, which were in a highly putrid and gangrenous state, particularly about the cæcum and arch of the colon. The small intestines were contracted, thickened in their coats, and firmly braced together by coagulated lymph. The stomach was rather inflated, and its coats thickened. The liver was much enlarged, and filled the whole hypochondriac and epigastric regions, extending to the right iliac region; and strong adhesions were formed between it and the diaphragm. On removing the omentum, the cæcum and arch of the colon were of a purplish colour, and in an advanced state of gangrene and ulceration throughout. The contents of the colon and ilium passed into the abdominal cavity through ulcerations which penetrated the coats of the colon. The descending colon was much contracted till it reached the pelvis. Part of the small intestines of the right side was inflamed, and bound together with yellow, pus-like matter, and coagulated lymph, and a large ulcer was found in the ilium. On removing the diaphragm from the liver, a large abscess was detected in the upper and convex part of the latter, which burst on exposing it. The abscess formed a cyst capable of holding two quarts of pus.* Spleen not altered.

Remarks.—This case was treated by one of the assistants of the regiment, and he appeared to have had no cause of suspecting disease of the liver until it was discovered upon dissection. The case occurred soon after the time when the exhibition of scruple doses of calomel in dysentery was introduced into our practice. It was given in this instance more frequently than we would have thought proper to prescribe it, and was

* See Plates V. and VI.

followed by a too active and frequent exhibition of cathartic remedies. The treatment, carried thus far, was evidently here injurious. The vascular depletions were not sufficiently copious at the commencement of the disease, and the calomel and cathartics were then given in a way which was calculated to increase the inflammatory action of the large intestines. On the 29th, the treatment was changed to that which was more suitable to the state of the patient, but the organic mischief was then produced. We insert this case for the purpose of instruction, which is to be derived as much from failure as from success.

CASE LXXXVI. — *Abscess of the Liver, &c.*

J. COLLINS, ætat. 47, long in India, was admitted into the General Hospital, Madras, on the morning of the 30th December, 1820. He has been kept out of the hospital, and treated by the garrison assistant-surgeon, from the 10th till this morning; but no account of the treatment has accompanied him. He was attacked six days ago with acute pain in the hepatic region, which continued till this morning, when it became easy; but he cannot lie on his left side. Complains also of pain of right shoulder, which came on two days ago. His gums are swollen and tender, and his mouth feels clammy; pulse 120 in the minute; skin natural; tongue slightly white and excited; urine high-coloured; countenance sallow; has had cold sweats since yesterday evening; not much thirst; appetite impaired. — Capiat mist. purg. ℥ij. stat. Appl. catapl. commun. cum unguent. hydrarg. ʒj. bis die, et fatus. Spoon diet.

Vespere. — Purged twice since admission pretty copiously; stools of a dark-brown colour; complains of being extremely weak; the pain in the hepatic region is increased when he takes a full inspiration. — Appl. hirud. xij. parti dolenti. R Calom. gr. x.; opii, gr. j.; pulv. ipecac. gr. ij.; cons. rosæ, q. s. Ft. pilul. h. s. s. R Mist. salin. compos. ʒjss. tertiâ quâque horâ. Cont. cataplasm.

31st. — Five dark-coloured, fetid stools, rather scanty; passed a very restless night; side and shoulder extremely painful; pulse 120, and small; skin of natural heat at present, but he complains of having been very hot all night; says that he has had no rigors since his illness; troublesome cough, with expectoration of phlegm; he feels the pain chiefly at the posterior part of the liver, which is increased on a pressure being made, and is very acute about the region of the gall-bladder when he takes a full inspiration; tongue extremely excited and furred; great thirst. — Capiat mist. purg. ʒij. stat. Appl. catapl. ut antea, et fatus. Cont. mist. salin. compos. Appl. hirud. xvj. parti dolenti.

Vespere. — Evacuation dark, fetid, and copious; had a cold sweat, which continues; pulse very small and quick; side easier since the application of the leeches; considerable fulness, and the ribs of his right side are raised; great thirst. — Catapl. et fatus. R Pilul. alter. no. 1. ter die. R Mist. amar. cum sennâ, ℥ij.; spirit. lavend. 3ss.; aquæ ammon. ℥xx. M. ft. h. s. s. Arrow-root and wine.

January 1st, 1821. — Passed a very restless night; at two o'clock this morning he was attacked with very severe pain in the right hypochondrium, which impeded his breathing considerably, and he could only lie on his right side; was also attacked at the same time with a cold sweat. — Had fomentations ordered, and a draught, with mist. camph. ℥jss.; tinct. opii; æther. āā 3ss.; which relieved him; but the pain about the false ribs is still very acute, particularly on pressure, and there is general fulness and uneasiness over the whole hepatic region; respiration hurried and oppressed; tongue white, and much excited; thirst urgent; one dark-coloured, feculent, scanty evacuation since last report; urine scanty and high-coloured, and he is extremely weak; pulse 108, weak. — Appl. hirud. viij. parti dolenti. Empl. lyttæ ampl. regioni hepatis. Sumat mist. purg. ℥ij. stat. Injiciatur enema domesticum, et repet. si opus sit. Cont. mist. salin. comp. tertiâ quâque horâ. Arrow-root and wine for dinner.

The symptoms and treatment varied but little from this time to the 5th, when the following report is given.

5th. — Pulse 120, and small; skin natural; countenance sunk, dejected, and very sallow; tongue loaded, and extremely excited; stools rather scanty, and of a very black colour; says he feels inclination to pass more, but cannot; pain in side very acute; urine scanty; great thirst; passed a restless night; he takes a little arrow-root and wine occasionally. — R Extract. colocynth. gr. x.; calom. gr. vj.; antim. tart. gr. $\frac{1}{6}$; ol. anisi, ℥ij. M. ft. pilul. ij. stat. sum. Cont. catapl. et fatus. Enema anodyn. h. s. ter die. Cont. vinum.

6th. — Has had several motions to-day, the same as usual in colour; pulse 100; tongue much loaded; seems much exhausted, and complains of pain in the side; skin cold. — Capiat pilul. alter. no. 1. ter die. Cont. catapl. et diæta ut antea. R Spirit. æther. sulph. 3ss.; tinct. opii, ℥xxx.; aquæ menth. pip. 3x. M. ft. h. s. s. Enema emol. p. r. n.

From this time he gradually became worse. Sago, arrow-root, and wine, were given him; and poultices were continued, in order to promote the external pointing of the abscess, but without effect. He died early in the morning of the 10th.

Sectio Cadaveris, three hours after Death. — Upon opening the abdomen, some fetid

pus was found diffused over the omentum and intestines in the right iliac region; and on raising up the right lobe of the liver, an immense quantity of matter issued from an abscess that had apparently given way a short time before death. The abscess was situated in the upper part of the concave surface of the right lobe; adhesions had formed between a portion of the liver and the diaphragm; the small intestines were filled with a dark-brown-coloured fluid, highly offensive to the smell; the head of the colon was in a state of great disease, several portions of the small intestines being glued to it on its outer surface, and its mucous surface was ulcerated; the gall-bladder was filled with a brownish-green fluid; the thoracic surface of that portion of the diaphragm to which the liver was adhering beneath was in a state of inflammation, at least the pleura covering it was crowded with red vessels, injected with florid blood; the lobe of the right lung resting on this part had begun to form adhesions, making it probable that had the patient lived longer before the abscess gave way, it would have discharged its contents into the lungs.

Remarks.—Abscess had evidently, from the cold perspirations of which he complained, been formed before this man was admitted. Nothing more, therefore, could be attempted than to procure the external pointing of the abscess, and to carry off the morbid secretions from the bowels.* This case is interesting, as it shews the manner in which adhesions of the lungs to the diaphragm are brought about in cases where abscess finds its way into the lungs.

CASE LXXXVII. — *Abscesses in the Liver, Disease of the Ducts and large Intestines, &c.*

JOSEPH GLOVER came into hospital 1st of April, 1817, with hepatitis, the acute symptoms of which yielded to bleeding and copious purging. He has since had symptoms of biliary calculi, which have been very distressing; his mouth is nearly sore; he has less pain, but is much reduced, and has very frequent cold sweats: his pulse at all times shews a great degree of irritation; his bowels were formerly costive, they are now easily moved by medicine, and his evacuations are morbid;

* The use of purgatives, in cases of this description, appears requisite, in order to empty the bowels, and to prevent their contents from pressing on the enlarged and engorged liver, as well as to remove the morbid and acrid accumulations themselves. In this case the motions were scanty; and the acute pain felt in the latter periods might have arisen from this cause. Dissection, however, shewed that it must have been occasioned by the rupture of the abscess producing inflammation of the peritoneum.

has passed some lumbrici; he now takes bark and acid. — R Pulv. calumb. comp. bis die. Pil. hydrarg. nocte maneque. Haust. anodyn. h. s. s.

April 1. — Has been very sick in the night, and has vomited a great deal of pure water; no pain at all; stools more feculent; perspires much, and had cold shiverings; pulse 96; we fear that an abscess is forming; says that he had an attack of this kind in Spain about six years ago; pain in his side has returned. — Apply a blister to his side. Cont. pil. hydrarg.; pulv. calumb., et cort. Peruv., cum acido. Sago and fowl for diet, and a little punch.

Evening. — Complains of a teasing pain in his right side, with sickness; pulse frequent and small, evincing great irritation; stools bloody, with mucus; skin cool and moist. — Pil. hydrarg. gr. v.; opii puri, gr. ij. ft. pil. stat. sumend. The blister is doing its duty.

Eight o'Clock. — No relief at all; he has great thirst. — Mist. salin. febrif. Repet. pilul. ut antea.

2d. — Feels easier this morning, but did not sleep much; he perspired much in the night; the sickness and pulse the same; skin cool and moist; tongue clean. — Cont. pulv. calumb. Omit the bark. Mist. salin. febrif. Cont. pilul. hydrarg. gr. v. bis die. Enema purg.

3d. — Stools more feculent, with some green, viscid matter, and a great quantity of viscid mucus, of the colour of fæces; he did not sleep last night, and was sick, without being able to vomit; he is better this morning in every respect; has no pain in his side; had some pain about the stomach last night, which has left him; pulse 106; skin natural. — Cont. mist. salin. Haust. amar. cum sennâ, et magnes. vit. ʒij. M. stat. sumend. Repet. pilul. hydrarg. cum opio stat. et h. s.

4th. — Has slept very little, but is free from pain; his tongue is dry and excited, but perfectly clean; pulse frequent; skin cold and moist; stools feculent, with small lumps of hardened fæces, and the appearance of membranous matter, with blood; has no sickness at stomach, but complains of exhaustion from the state of the weather. — Omit the opium. Repet. pilul. hydrarg. R Mist. salin. febrif. ℥jss.; aquæ ammon. ʒij. Strong coffee for breakfast. Repet. haust. amar. cum sennâ, ʒij. Magnes. vit. ʒiij. M. stat.

Evening. — Stools watery, with the appearance of some blood mixed with fæces; his skin is cold, and he has not the power to speak; pulse frequent, 112 in a minute, and much smaller than usual; he has no pain. — Spirit. lavand. comp. ʒiij.; aquæ ammon. ℥xxx.; aquæ puræ, ʒij. M. stat. A little warm mulled wine, which

repeat every half hour. From this time he rapidly declined, and died at 3 P.M. of the following day.

Examination, two hours and a half after Death.—The liver appeared much larger than natural; the right lobe of a dark colour, and the left lobe of a pale leaden hue. On removing the liver for examination, a very large abscess was discovered on the convex surface, and was attached to the diaphragm, which formed part of its cyst. Another abscess, of nearly the same size, was also discovered on the convex side of the liver, but it had not formed any adhesions at all. The pus formed in the latter abscess was thick, white, and well digested; and that in the former was watery, curdled, and of various colours. There was no abscess in the left lobe. The gall-bladder was full of thick, inspissated green bile. The gall-ducts, both hepatic and cystic, were amazingly enlarged, and the ductus communis choledochus, at its entrance into the duodenum, was considerably dilated, much thickened and hardened in its coats, having quite the appearance of cartilage: this cartilaginous state extended nearly an inch down the duct. A similar appearance was observed near the entrance of the cystic duct into the gall-bladder. There was considerable inflammation in the duodenum, extending some inches round the ductus communis choledochus. The small intestines were inflated, empty, and transparent. The cæcum was contracted, thickened, and ulcerated, and there were spots of inflammation and ulceration through the colon. The stomach had no particular appearance, except that of slight inflammation of the portion near the spleen. The spleen and kidneys were healthy. The lungs were pale, but not diseased. Heart natural.

Remarks.—That disease had existed in the ducts was evident from the *post mortem* examination, and it was extremely probable that the dilated state of the ducts arose from the recent passage of gall-stones. The inflamed state of the common duct and duodenum countenances also the correctness of the opinion. Very probably, however, the formation of abscess was coeval with the passage of calculi, and that the symptoms of the latter concealed the former, which became more apparent after the gall-stones had passed into the intestines.

CASE LXXXVIII.—*Abscess of the Liver, opening into the Alimentary Canal.*—*Remarks.*

March 1st.—THOMAS ASTELL, Camp Kurnool, came into hospital 22d February, 1817, with a slight attack of dysentery, which is now nearly removed; but his tongue still remains foul and excited. He complains not of any pain or uneasiness upon

examination; his skin cool, and his pulse somewhat accelerated towards evening. — Mist. emetic. stat. He vomited a considerable quantity of bile after the emetic, and took a wine-glassful every two hours of the mist. salin. febrif. with spirit. æther. nitros. and elix. paregor.

2d. — He has been attacked in the night with severe pain in the right side; tongue foul and dry; stools watery; pulse small, and 109; skin natural; the pain is increased on pressure in the region of the liver, but there is no hardness; thirty leeches were applied, and followed by poultices; the pilul. hydr. cum calom. no. 1. was given thrice a day; a drachm of mercurial ointment was rubbed in night and morning; a purging draught was taken in the morning; the saline mixture given at intervals; and a blister applied to the hypochondrium.

On the 4th the pulse was 100; skin cool; stools more feculent and natural, and well marked with hepatic bile; tongue cleaner and less excited; no pain. — Cont. pilul., mist. salin., haust. aperiens, et frictio.

The symptoms improved; the medicines were continued; and on the 8th the tongue was quite clean; but the stools were crude, of a clay consistence, and green colour; pulse quick.

11th. — Pulse quick, with an irritable beat; he looks well, and says he has no pain; stools crude and feculent; tongue less excited; mouth somewhat affected. — Cont. pilul. et haust. primo mane. — This man having no appearance of disease but the quickness of his pulse, and having long been in hospital, was discharged for change of air; partly under the supposition that his pulse was artificially irritated, — a common practice amongst soldiers, particularly those who are inclined to skulk; and a circumstance which often prevents good soldiers from reporting themselves ill, in sufficient time for medical aid being serviceable; and a circumstance also which often leads the medical practitioner into error, that cannot be so readily remedied in a warm as in a temperate climate: it evidently gave rise to error in the present instance, as will be seen from the sequel of the case.

Re-admitted 23d March, 1817, about 4 o'clock, P.M.; attacked on guard yesterday evening with violent pain in the scrob. cordis and umbilicus, and slight pain in his side; tongue clean, but dry; he is in a profuse perspiration; pulse frequent; no heat of skin. — Apply twenty leeches to his side and belly. Cal. gr. xij.; pulv. antim. gr. vj.; syr. q. s. Ft. pilul. h. s. s. Mist. salin.

24th. — Stools copious and bilious, with feculent matter; tongue foul and excited; has still pain across his belly and side; pulse quick, 100 in a minute. — Apply twenty leeches to the umbilicus, and a blister to his side. R Mist. purgans. ʒij.;

magnes. vitriol. $\bar{3}$ ss. M. stat. sumend. Cont. mist. salin. Repet. pilul. calom. et antimon. horâ somni.

25th. — Stools consist of a quantity of pure viscid mucus, with a little blood; strained a great deal in the night; pain in his side and belly quite gone; tongue clean; pulse frequent, 110 in a minute; skin cool; face flushed; but he says he has had no rigors or chills. — Pulv. purg. stat. Enema purg. Cont. mist. et salin. febrif. ut antea, et pilul. h. s.

26th. — Stools crude and feculent, but of a natural appearance, and some water; has some straining; feels no pain; pulse the same; tongue clean. — Mist. purg. $\bar{3}$ ij. Enema purg. Pilul. hydr. cum calom. no. 1. three times a day.

From this time the more acute symptoms diminished; but his pulse remained quick, his countenance became pale, and he lost strength. On the 29th, the bark, with acid, was given, and he was allowed two glasses of punch. He made no complaint of pain or uneasiness, but seemed to suffer greatly from the excessive heat of the season; the thermometer at the time ranging from 80 to 108 in the tents.

31st. — His tongue became dry and furred; stools feculent; and he complained of great thirst. — Omit the bark, as it seems to occasion the thirst and dryness of the tongue. Give the saline mixture, and a blue pill night and morning.

April 2d. — Much better; passed a good night; stools variegated and feculent, with the appearance of some pus; tongue clean; thirst diminished. — Pulv. calumbæ bis die. Cont. mist. salin. et pilul. hydr. Haust. aperiens cras mane. Chicken broth.

The symptoms and treatment continued as above until the 5th, when the stools were of a very extraordinary appearance, dark and pea-green bile, with a considerable quantity of something like pus mixed with blood; it has very much the appearance as if an abscess had broken and discharged its contents into the colon. We have long thought his liver affected with abscess, and think this event highly probable. Pulse quick, but full; tongue clean; skin cool and healthy. — Cont. pulv. calumb. ut antea. Haust. amar. $\bar{3}$ ij.; magnes. vitriol. $\bar{3}$ ij. M. Cont. mist. salin. ut antea.

6th. — Much better; passes pure hepatic bile, with some fæces, and pure pus, as from an abscess; pulse quick. — Cont. med. ut antea.

Evening. — Stools green and feculent; no pus; feels better. — Cont. med. ut antea. Two glasses wine a day.

7th. — Stools this morning pure bile, of a pale-green colour, with some feculent matter; no pus; he feels better; pulse still quick. — Cont. med. ut antea. Haust. amar. cum sennâ, $\bar{3}$ j.; magnes. vitriol. $\bar{3}$ jss.

Evening. — Stools pure bile, with feculent matter; and very offensive; has felt the heat very oppressive; tongue clean. Cont. ut antea.

8th. — The pure cystic bile that is discharged from this man every day is astonishing; it is precisely as if it had been squeezed out of the gall-bladder. He passed some morbid, feculent matter with it; feels very weak, but has no pain; tongue clean, but his pulse continues very quick; has no rigors or cold chills, and never had any, so far as he recollects; he perspired freely in the night. — Cont. pilul. Cont. pulv. Repet. haust. aperiens. Three glasses wine.

9th. — Stools the same as usual; pure, green, frothy bile, with some feculent matter, of a reddish tinge; pulse very quick; tongue continues quite clean. — Cont. med. ut antea. Cont. wine. R Acid. nitros. ʒij.; tinct. opii, ℥xl.; aquæ puræ, ℔ij. M.; a wine-glassful occasionally.

Evening. — Stools highly bilious, and green, as before; feels better, but is very languid, from the great heat of the weather. Cont. med. ut antea.

12th. — Very drowsy, and exceedingly exhausted, from the weather; stools still green, feculent matter, but they have lost the appearance of pus, which they had some time since; his tongue is dry this morning. — Cont. med. ut antea. Haust. amar. cum sennâ, ʒjss.; sal. cath. amar. ʒjss. M.

13th. — Slept very well last night; stools green, feculent matter as before, with the appearance of curdled pus and blood, as if the abscess had refilled, and again discharged its contents; he perspires profusely, and he suffers very much from the extreme heat of the weather; pulse still quick. — Cont. med. ut antea. Port wine.

Evening. — No change; stools feculent, green, and mixed with pus. — Cont. ut antea. Madeira wine.

From this time his stools continued green, and otherwise morbid, and at intervals contained much pus. He gradually sunk, and died on the 20th. Being then on our march to Hyderabad, the body could not be inspected.

Remarks. — There is no doubt of abscess having been forming in the liver previous to the time of his discharge from the hospital for change of air. The state of the pulse and appearance of the stools seem to shew that such had been the case. There is no doubt that the abscess had burst into the alimentary canal, and that it had been partially filled on several occasions, and discharged itself,—thus occasioning the purulent state of the motions noticed in the abridged history here given of the case. A case, as respects the symptoms of abscess, resembling the present, came before us lately in London. It occurred in a lady, who was not supposed to

have been suffering under hepatic disease. The existence of pus in the stools had been frequently remarked by the patient as giving her relief, but had not received due attention.

CASE LXXXIX. — *Abscess of the Liver, opening into the right Cavity of the Chest.*—
Examination.

— SMITH, a fine robust soldier, lately arrived from England, was admitted into hospital at Madras on the 13th of August, 1819, and died on the 26th. The symptoms, on admission, were those of dysentery, supervening to acute hepatitis, with severe cough. He had been complaining of severe pain of his right side for several days before his admission. Upon being received into hospital, his pulse was full and strong; the dysenteric symptoms urgent; cough troublesome and suppressed; pain in the side diminished. He was immediately bled to upwards of forty ounces; calomel and aperients were given; and blisters and saline diaphoretics ordered. Dyspnœa, with urgent sense of suffocation, suppressed cough, came on; and he died with all the signs of hydrothorax.

Examination. — An immense abscess was discovered in the superior surface of the liver, which had partly emptied itself into the right cavity of the thorax and bronchial ramifications of the right lung, through the diaphragm. A great quantity of whey-like matter was found in this cavity; and the quantity altogether detected in the lungs, in the liver, and cavity of the pleura, amounted to upwards of a gallon. The right lung was adherent to the diaphragm at the place of the opening through it; but the adhesions had been either incomplete, or had given way at the time of the flow of the purulent fluid into the lungs. The gall-bladder contained very little bile. The intestines were not materially diseased.

Remarks. — Probably the only chance of combating the disease in this case with success was during the period of illness which had elapsed previous to his admission. We are convinced that pus was formed in the liver before he came under our care. It is indispensably requisite to the successful treatment of Europeans lately arrived in India, and in warm climates generally, to get them into hospital the first moment of ailment. Unfortunately, however, they are generally reluctant to go into hospital.

CASE XC. — *Dropsy of the Abdomen; Abscess of the Liver, breaking into the abdominal Cavity; slight Ulceration of the large Intestines, &c. — Examination.*

CHARLES RYMER has been a considerable time under treatment for chronic hepatitis in the hospital at Trichinopoly. Leeches have been applied, and the blue pill and purgatives exhibited. The motions, however, continued to be morbid, and to evince a disordered state of the biliary secretions. On the 2d of July, his stools were observed to be tinged with blood; and he complained of slight pain in the lower part of the abdomen. The motions continued in this state, with slight alteration, being sometimes feculent and natural, at other times disordered and tinged with blood, until the 9th. The pain complained of on the 2d had, however, disappeared, and he had in other respects improved.

10th. — No pain or uneasiness; appetite good; stools dark and feculent. — Pilul. hydr. h. s. Infricetur unguent. hydr. lateri dextro. Ol. ricini, ℥ij. primo mane.

12th. — Complains of pain in the right side when he breathes; mouth not affected; appetite good; stools copious and foul. — Hirud. xij. parti affectæ. Cont. pilul. et frictio.

13th. — Pain in the side somewhat relieved; stools copious and foul. — Apply a blister to the side. Continue the other medicines.

14th. — Pain gone. — Continue the medicines, and give the purging powder the following morning.

The symptoms and treatment were the same until the 22d, when a heavy pain was complained of in the side; the countenance became more sallow, the pulse more frequent, and his strength much impaired. — Omit. med. Haust. amar. meridie.

23d. — The pain is felt only at one particular point, internally; stools copious, but foul; pulse 75; skin warm; appetite pretty good. — Imponatur emplast. lyttæ. Mist. amar. ℥ij. meridie. Mist. salin. tertiis horis.

24th. — Pain diminished by the blister; stools copious, somewhat thin, and of a peculiar reddish colour; pulse 75; legs œdematous; skin cool. — Cont. mist. salin. et haust. amar.

From this time water began to collect in the abdomen; and, in two or three days, increased so rapidly, as to require an operation. Digitalis, calomel, and squill pills were afterwards prescribed, and the cream-of-tartar drink. The urine became more copious immediately after the operation, but hiccup supervened, and proved distressing.

August 1st. — Pulse 86; thirst urgent; and swelling of the abdomen again beginning to appear. The medicines were continued, with mercurial frictions to the

abdomen, and the camphor mixture was given with aqua ammonia, which, in a day or two, removed the hiccup.

5th.—The accumulated water was again removed by an operation. A quart of nearly pure water first came away: the rest of the fluid withdrawn was mixed with about two pounds weight of healthy pus. The stools were now morbid, and mixed with blood. — Cont. med.

6th.—Slept a little last night, and passed about eight ounces of urine in the morning; has had no return of the hiccup; stools foul, and mixed with blood; thirst urgent; pulse 86.—Cont. pilul. et crem. tart. et frictio.

The abdomen again became distended by fluid; and on the 8th it was drawn off by means of an operation, and eight quarts of water were removed, mixed with healthy pus; stools feculent; pain and tension of the abdomen; urine scanty and high-coloured. — Repet. med.

10th.—Stools feculent, dark, and frothy; neither straining nor griping; complains of pain in the right side, with distension of the abdomen; pulse 96; skin warm. — Cont. med.

12th.—Complains of griping and tenesmus; appetite pretty good; legs œdematous. — Repet. pilul. et solut. crem. tart. Enema anodyn. h. s. R Decoct. cinchon. ℥viij.; tinct. ejusdem, 5vj. A wine-glassful twice a day.

The symptoms and treatment were unchanged until the 16th, when about eight pints of fluid, nearly one half of which was pus, were removed by an operation.

17th.—Has had several stools in the night, and passed some urine; pulse 86. — Cont.

Evening.—Stools foul and copious; he passed about six ounces of a purulent fluid in his motions. — Cont. med.

18th.—Stools copious; urine about eight ounces; some discharge still from the opening; feels easy; sleeps well; pulse 92; he appears to be losing ground.—Cont. med. omnia. An anodyne enema.

Evening.—Stools frequent, mixed with blood; discharge continues from the opening; he is very weak.—Omit. pilul. et crem. tart. Cont. mist., cort. Per., et vin.

19th.—The size of the belly much diminished; about one pint of the discharge came away when at stool; fæces morbid, mixed with blood; urine ten ounces; pulse 72.—Cont. cort. et vin., with animal food.

Evening.—Made about eighteen ounces of urine since last visit; belly feels flaccid; countenance changed; very weak; pulse 90; stools yellow.—Cont. cort. et vin.

20th.—Stools foul, as usual; urine about six ounces; some discharge from the

orifice; abdomen not increased in size; debility seems to gain ground; pulse 78; he complains at times of tenesmus; there is some blood in the stools. — Cont. cort. et vin. Anodyne enema at ten o'clock.

Evening. — Stools copious and bright-yellow; urine same quantity; his countenance has changed for the worse; evacuations frequent; no increase of swelling in the abdomen, from which there is still a purulent discharge; pulse 90, and weak; appetite lessened. — Cont. cort. et vin.

21st. — Seems to get weaker; pulse 72; stools morbid; urine as usual; belly quite flaccid; appetite bad. — Cont. cort. et vin. Enema anodyn. stat. et h. s.

22d. — Not worse; stools are crude, yellow, and liquid; belly very lank; pulse 80. — Cont. cort. et vin. Enema anodyn. stat. et h. s. Apply a bandage round the body.

23d. — Seems very low; pulse 78; stools frequent, without pain. — Cont. cort., vin., et enema.

Evening. — Is declining fast; pulse 90, weak; complains of thirst; belly quite flaccid; stools yellow, thin, and crude. — R Mist. cret. cum tinct. opii, \mathfrak{z} vj.; tinct. kino, \mathfrak{z} j. M.; \mathfrak{z} j. bis die.

24th. — Is sinking fast; pulse scarcely perceptible. — Died at 3 o'clock, P.M.

Examination two hours and a half after Death. — About four pounds of a mixture of blood and serum were found in the cavity of the peritoneum. Omentum a thickened, putrid mass, extending over, and adhering closely to, the surfaces of the great and small intestines. Liver enlarged and flaccid. In the right lobe was discovered the cyst of a large abscess, containing a small quantity of pus and grumous blood. Its opening was into the cavity of the abdomen, in the concave surface of the liver, and near its edge. The inner surface of the colon was slightly ulcerated, as also the superior portion of the rectum. The outer coat of the intestine was remarkably white. Stomach and spleen were sound: the kidneys presented nothing remarkable. In the pericardium, about five ounces of a serous fluid; none in the thoracic cavities. The left lung adhered to the pleura costalis: it was a mass of disease and suppuration. Its weight was much increased, and it did not collapse on exposure to the air. The right lung was but slightly affected, and formed no adhesions.

Remarks. — The abscess must have been existing from the first date of the present report. It is difficult to determine the time when it burst into the peritoneal cavity. It could not have been long subsequent to the time at which the internal pain was felt at one particular point; and it must have been previous to the period, or thereabout, when pus was found in the fluid withdrawn by the operation of the 5th of the month in which the patient died. In either case, the patient lived longer after this occurrence

than we recollect in any similar instance of abscess opening into the peritoneal cavity; and the symptoms induced by the presence of the purulent fluid in this situation were less severe and indefinite than are usually observed, signs of acute peritonitis being generally well marked in such cases.

CASE XCI. — *Hepatitis, terminating in Abscesses opening into the Arch of the Colon, and through the medium of the Gall-ducts into the Duodenum.*

MICHAEL CLINCH, admitted on the evening of the 23d December, 1814, (from the flank companies of the regiment, which had been exposed to wet and fatiguing marches,) in the advanced stage of inflammation of the substance of the liver. There were, on his admission, purging; foul and dark tongue, encrusted with mucus; parched lips; cold and clammy skin; pulse 96, small; countenance livid; considerable tumefaction at the margin of the right false ribs, with great tenderness. — Had a calomel and antimonial pill.

24th. — Stools are dark, but feculent; no pain in passing them; had some sleep; pulse 86; tongue foul and dark, not dry; skin covered with a warm moisture. — A blue pill every second hour. 3j. of mercurial ointment to the side. Saline mixture.

Evening. — Five stools, with clots of grumous blood, and much fæces; some griping; pulse 84; tongue clean; skin of a moderate heat; took four pills. — Calomel and antimonial pill, and saline mixture. An emollient enema.

25th. — Stools consist of blood, bile, and purulent matter; finds himself easier; sweats in the night; had no rigors; pulse 90, not weak; tongue much cleaner; skin is moist and warm; no pain on passing his stools; the swelling and tenderness of the side continue. — Saline mixture every second hour. Glass of bitter infusion. Enema emolliens.

Evening. — Stools are very morbid, consisting of blood and feculent matter; griping, and much tenderness across the umbilicus; pulse 89; tongue cleaner; skin warm and moist. — Omit the frictions. Sixteen leeches to the lower belly. Calomel and antimonial pill, and repeat it at night. Enema emolliens.

26th. — Appears very ill; was delirious in the night; manner now incoherent; one stool of blood and mucus; no complaint on pressure of the belly; tongue loaded; extremities cold; pulse frequent, irregular, and feeble. — R Ol. ricini, ʒjss.; aquæ menth. pip. Enema emolliens.

Evening. — Stools are copious, one with much feculent matter in it; tongue very foul and dry in the centre; has had copious cold sweats; tumour of epigastrium

not altered in size. — Calomel and antimonial pill. Enema emolliens. Mistura salina.

27th. — Stools are better, quite feculent; perspired a good deal in the night; at present he is in a general cold sweat; tongue moist and clean; pulse regular, feeble, 96; tumour of epigastrium not decreased in size; it appears to affect his breathing. — R Aquæ menth. pip.; aquæ fontanæ, āā ʒiij.; spirit. nitros. æther.; tinct. cinchon. āā ʒiij. M. Cyath. vinos. tertiis horis. Enema emolliens.

Evening. — The stools appear to be mixed with the contents of an abscess; is very much exhausted; respiration hurried; tumour of belly less; pulse very frequent, feeble, and irregular; cold sweats on the extremities, and very restless and depressed. — A draught, with tinct. opii, mxxxv.; aquæ menth. pip. ʒj. Cont. mist., and an emollient enema.

28th. — Died at 6 o'clock, A.M.

Dissection, two hours and a half afterwards. — Liver was a mass of disease, occupying the whole hypochondriac and epigastric regions: it contained three large, distinct abscesses, one of which opened into the arch of the colon, at which place that intestine presented its inner coat covered with small ulcerations, such as are occasionally found in dysenteric subjects. The contents of another abscess also passed off, in part by the ducts, into the duodenum. The greater part of the colon was sound, except the portion to which the liver adhered. The other viscera were sound. The right lung was compressed, from the increased size of the liver.

Remarks. — The termination of the disease in abscess was evident on the admission of this patient, and but little could be done further than to carry off the diseased secretions, and support the powers of life.

CASE XCII. — *Chronic Hepatitis; small Abscesses in the substance and surface of the Liver; Ulcerations of the Colon.* — (See Plate IX.)

THOMAS DONACLIFF, aged 20, arrived from England in June, and admitted into hospital 29th of October, 1816. Has been ill for several days, but has not reported himself. His complaints have been brought on and aggravated by the intoxicating liquors sold in the Bazaar, since his arrival at Kurnool. Complains of pain of the abdomen, and voids bilious stools, with blood; tongue foul. — Ol. ricini, statim. Appl. hirud. xx. Calom. gr. xij. h. s. et enema emolliens.

30th. — Stools feculent, of a green colour, with some blood; pain in the belly continues; tongue foul. — Enema purg. stat. Repet. ol. ricini, ut antea.

Vespere.—Feels a good deal of pain about the caput coli; stools crude, of a pale colour; tongue foul and white; pulse full.—Apply eighteen leeches to the part. Repet. enema, ut antea. Calom. gr. vj. h. s. s. Mist. salin. febrif. cum spirit. æther. nitros. every two or three hours.

31st.—Was much easier in the bowels last night; feels better this morning; bilious, feculent stools, of a green colour; pulse accelerated; has a sense of weight in the head, with a degree of stupor; tongue foul and white; a bitter taste in the mouth; has been subject to headach in Europe.—Apply eight leeches to each temple.

Vespere.—R Mist. salin. febrif. ℥ij.; spirit. æther. nitros. ℥ij.; vin. antim. ℥iij. M.; a wine-glassful every two hours. Appl. hirud. xvij. regio. hypogas. Postea, emplast. lyttæ ampl. super abdom. Calom. gr. xij. h. s. s.

November 1st.—Was feverish and restless in the evening and night; skin dry; pulse small; no material change.—Mist. purg. stat. Enema purg. Cont. mist. salin.

Vespere.—Tongue furred, of a red appearance towards the apex, yellow towards the base; skin hot, dry; pulse 96; stools very offensive; feels a general soreness over the abdomen, but no particular pain.—Repet. enema. Cont. mist. salin. Tamarind drink. R Calom. gr. xij.; pulv. antim. gr. iij.; opii, gr. j.; syr. q. s. Ft. pilul. h. s. s.

2d.—Pulse 74; rather small; tongue dry, loaded, still yellow; feels no pain or sickness at stomach.—Repet. mist. purg. et enema. Cont. mist. salin. Repet. pilul. h. s.

3d.—Pulse 72, rather small; tongue cleaner, still yellow; has been purged in the night; stools of a dark colour, copious, with some blood and hardened fæces; feels no pain.—Ol. ricini, ℥ij. Enema purg. Cont. mist. salin. Repet. pilul. h. s.

4th.—Pulse 78; skin rather dry, greasy; tongue furred, yellow; feels soreness over the belly; no sickness; was purged frequently in the night.—Appl. empl. lyttæ regio. hypogas. R Ol. ricini, ℥ij. statim. Repet. enema. Cont. mist. salin. cum vin. antim. ℥ij. Repet. pilul. h. s.

5th.—Stools more feculent, still morbid; tongue cleaner; pulse as before; pain in the umbilicus removed by the blister.—Repet. ol. ricini. Repet. enema, ut antea. Cont. mist.

Vespere.—Feels weak; thirsty; pulse small and frequent.—R Tinct. opii camph. ℥ss.; aquæ ammon. ℥xx.; aquæ puræ, ℥jss. M. ft. haust. stat. capiend.

6th.—Passed a large portion of the internal coat of the intestines by stool in the night; pulse small and weak; says he feels generally better; tongue the same as yesterday; has no pain in the belly; has a sense of weight in the head; eyes unusually

bright; passed rather a restless night.—Repet. ol. ricini. Repet. enema. Cont. mist. salin. Appl. emplast. lyttæ temp.

Vespere.—Pulse 98, small; tongue yellow, foul; stools scanty; from the imbecility of his mind, he cannot express his meaning, and has never given us satisfactory explanation of his feelings.—R Calom. gr. xij.; pulv. antim. gr. iij.; opii, gr. j.; syr. q. s. Ft. pilul. h. s. s.

7th.—Very urgent singultus; pulse 96, rather fuller; was purged in the night; stools watery, bloody, and very offensive; feels uneasiness about the stomach, and heartburn.—R Magnes. alb. ʒj.; tinct. opii, m̄xl.; aquæ menth. pip. m̄ij.; aquæ puræ, ʒij. M. ft. haust. et repet. pro re natâ. Appl. emplast. vesicat. regio. epigast. Calom. ʒj.; opii, gr. ij.; cons. rosæ, q. s. Ft. pilul. h. s. s. R Mist. camph. ʒviij.; spirit. æther. nitros. ʒij. M. ft. mist. Two spoonsful every hour.

8th.—Singultus continues, but is not so frequent; pulse very small, hardly to be felt; tongue cleaner and moist, still yellow; was purged in the night; stools bloody; very strong wish for wine.—Cont. mist. camph. R Pulv. ipecac. gr. iij.; opii puri, gr. j.; syrup. q. s. Fiat pilul. stat. et repet. vespere. A little wine and water to gratify him.

Vespere.—Has passed a large portion of the gut this moment; the singultus continues distressing; feels sickness at stomach, and vomits dark-green bile.—R Pulv. ipecac. gr. xx. Ft. pulv. emeticus stat. cap. Haust. anodyn. h. s. s.

9th.—Ejected an immense quantity of green bile by the emetic, and felt the stomach relieved, but had a very restless night; the singultus is very distressing; has passed more of the internal surface of the gut; stools green, feculent mucus; seems very uneasy, but does not complain of any pain, except from the blister; tongue foul, rather of a darker yellow than usual; feels sickness at stomach; pulse 108, fuller.—R Camph. gr. iij.; opii puri, gr. ij.; ammon. gr. ij.; cons. rosæ, q. s. Ft. pil. Stat. sumend. et repet. secund. quâque horâ. R Calomel. gr. xx.; opii, gr. ij. h. s. s. His wishes are indulged in regard to wine and water.

10th.—Has been vomiting all day; singultus very distressing; pulse weak and languid; sinking fast.—Repet. pilul. camph. ammon. Haust. anodyn.

11th.—The singultus continues very distressing; his pulse is sinking, and countenance much changed; no pain; was purged in the night; stools scanty.—Enema emol. Repet. pil. ut antea.

12th.—Singultus less; tongue with a yellow crust; pulse weak, small; skin cold, not clammy; he is much exhausted, and is quite beyond the power of medicine.—No med.

Died on the 13th, about five o'clock, A.M.

Examination, two hours after Death.—The liver was exceedingly enlarged, filling the whole epigastrium, and was covered with white spots, and its surface was of a mottled or marbled appearance, evincing the existence of inflammation and congestion. The spots on the surface of the liver, when divided, were found to consist of small abscesses, containing a very thick or semifluid pus, and seemed to have formed between the substance of the viscus and its covering. The internal structure was inflamed, congested, and studded with numerous small collections of matter resembling those on the surface of the viscus. The colon was wrapped up in the omentum, and an ulcer had penetrated the ascending portion, through which the contents were discharged into the abdomen. The small intestines were inflamed, much thickened, contracted, and connected to the other viscera by adhesions, so strong that they could not be separated without rupturing their coats. The vessels of the mesentery were amazingly turgid, and general inflammation had seized the whole of the small intestines, from the duodenum to the caput coli. The small intestines were so contorted and contracted in the lower part of the pelvis, that it is inconceivable how any thing could pass through the tube. The caput cæcum was in a state of deep ulceration, and the whole of the internal coat had sloughed, and lay loose in the bowel; the whole of the large gut was in a similar state, covered with pus and green mucus. The rectum was of a dark-red colour where the internal coat had been removed, and was covered with rough, deep ulcers. The descending portion of the colon had been highly inflamed, and was of a dark-red colour. The ulcer, which had made its way through the gut at the head and middle of the sigmoid flexure, was found to be covered with thick sloughs. A pouch was formed of the intestinum ilium, as large as the gall-bladder, and traversed with large blood-vessels, which was not the case in the adjoining portion of the gut. (See the Plate in the Second Volume.) The stomach was much contracted in size. The pylorus was corrugated, and the coats were thickened throughout. The liver, throughout its whole substance, was studded with small abscesses, containing pus of a greenish-yellow colour, and thick consistence.

Remarks.—The appearances in this case are similar to those found in numerous other cases of disease produced by drinking bogee and other intoxicating liquors sold in camps.* In diseases arising from this cause, general depletions are not borne by the patients; and they often sink under them without any arrest of the inflammatory action. In these cases, local depletions are advantageous, and should be practised according to the circumstances of the case.

* For an account of these, see "Sketches of the Diseases of India," p. 307, *et seq.*

CASE XCIII. — *Abscess of the Liver, Diseased Pancreas and Cystic Duct.*

H. MACKLIN, ætat. 28, supernumerary serjeant, admitted April 25, 1819, with symptoms of biliary obstruction and chronic inflammation of the liver, for which he has been leeches, fully and copiously purged, and on two occasions he has taken emetics, and mercurials have been prescribed, but without producing any decided benefit. There seems to be spasmodic stricture of the ductus communis choledocus. He now takes mist. salin. febrif. cum tart. emetic. — *May 1.* Tongue very much loaded; bad appetite; oppression at stomach; pulse quick. — Enema purg.

Evening. — Has been fully vomited and purged; passed a great deal of green bile both ways; his pulse is still frequent; tongue rather cleaner; skin not hot. — Calomel. gr. xx., opii, gr. ij.; pulv. antim. gr. iij. h. s. s. Tamarind drink.

2d. — Was purged, and vomited also in the night; he passed green, bitter matter, very offensive and sour; he feels much better this morning; pulse 110, but more regular; says he feels much relief from the oppression; his tongue still foul, but moister than it was before; has some inclination to eat. — R Mist. salin. febrif. cum ant. tart. gr. ij. ut antea. Repet. calomel. gr. xx. h. s. Mist. purg. ℥ij. cras mane. Port wine made warm with some spice; toasted bread.

3d. — Passed a bad night, and vomited the same kind of matter as previously; pulse 104; frequently purged; stools very large; tongue cleaner and moist, but looks as if liquorice was spread on it. — R Pil. hydrarg. cum calomel. three times a day. Mist. amar. cum sennâ; cum tinct. card. ℥ij. nocte maneque.

4th. *Evening.* — Complains of oppression at the scrobiculus cordis; his tongue is blacker, but moist; his stools feculent and watery, with blood; pulse quick and irritable. — Enema purg. Apply eighteen leeches on the scrobiculus cordis. R cal. gr. x.; opii, gr. ij. M. ft. pil. h. s. s.

5th. — Pulse 100 in a minute; skin cold; a general moisture over him; feels the oppression at the præcordia much relieved; tongue cleaner, but still furred; passed a tolerably good night; he had hiccup yesterday, which he says is better this morning; has no difficulty in breathing at all. — Enema purg. R Mist. camph. ℥xij.; spirit. æther. nitros. ℥ij.; cinnamon. ℥ss. M.; a wine-glassful every three or four hours.

Vespere. — Oppression at the stomach continues; no sickness; pulse 105; skin hotter than natural; had several stools from the enema, of a yellow colour; thirst urgent; urine high-coloured; bad taste of the mouth continues. — Twenty leeches to the epigastrium. Repet. pil. calomel. gr. x.; opii, gr. ij.

6th. — Pulse 110; tongue still foul, but moist; feels no unpleasant sensation; the

oppression at the præcordia much relieved; skin rather cold and moist; but altogether, he says he feels much better; has an appetite. — Rub in ung. mercurial. over his belly three times a day, with a little camphor in it. Enema purgans. Repet. pilul. cal. gr. x. Opii, gr. ij. h. s. s. Tea.

7th. — Pulse 98 in a minute; tongue cleaner; skin more natural and cool; passed a tolerably good night; appetite returning; was not purged in the night. — Cont. frictio. et enema. Pilul. cal. gr. x. Opii, gr. ij. h. s. s.

8th. — Passed a very good night; skin moist and rather cold; pulse 102 in a minute; tongue much cleaner; there is no pain about the liver; there is evident fulness, but no distinct tumour; has had no tremors or rigors, and never had; tongue much cleaner; says he feels better than at any time since he came into hospital; appetite returned; but we do not like the character of his perspirations, — we fear the existence of an abscess. — Apply a large poultice over the liver, and spread ʒij. ungt. mercurial. on it. Cont. pilul. hydr. cum cal. ut antea.

9th. — Pulse feels quick, but is not more than 88; tongue becoming quite clean; mouth not at all sore; appetite improved; skin not so cold; he is very weak. Three glasses of wine. Bowels regular; stools natural. — Sago. Cont. ut antea.

10th. — Passed a good night; pulse small and very quick; tongue cleaner; mouth rather dry, with a metallic taste; skin cold; matter has evidently formed in his liver; and we fear that he does not tell us all he has suffered; bowels regular; stools yellow colour; there is considerable fulness in the region of the liver; much thirst. — Cont. frictio. mercurial. Apply the poultice. Cont. pilul. hydr. cum cal. six times a day. R Acid. nitros. ʒss.; sac. alb. ʒss.; aq. puræ, ℥ij. M. ft. mist. A wine-glassful occasionally.

11th. — Covered with cold, clammy dew; pulse continues very quick, 108 in a minute; says he is much better; has passed a good night, and feels stronger; but from his general appearance, we believe that an abscess has formed, and that he is rapidly sinking; his bowels are open; stools of a natural appearance; and water not at all high coloured; appetite very bad. — Cont. acid. nitros. Six glasses of wine in the day; let it be mulled, with some toasted bread. Sago or arrow-root diet. — Decoct. cinchon. ℥ij. Acid. vit. ℥xvj. M. A wine-glassful every three hours. Cont. poultice. R Tinct. opii, ℥lx.; sp. æth. nitros. ℥xxx.; aq. amm. ℥xx.; aq. puræ, ʒij. h. s. s.

12th. — Passed a very good night, and perspired a great deal; cold, clammy sweat; pulse quicker and weaker, 112 in a minute; tongue dark and furred; thirst urgent;

no pain at all of any kind; there is evident fulness in the region of the liver, but has not the least pain on pressure. — Cont. vinum et cinchon. cum acidis. Repet. haust. anodyn. h. s. — The symptoms and treatment as above until the 15th.

15th. — Skin more natural, not so much perspiration, and he has lost the tremor in his hands he formerly had; tongue still furred; he has a bad taste in his mouth, but no ptyalism; can lay upon either side with ease; stools natural; bowels regular. — Cont. ut antea.

Evening. — Skin cold; pulse as in the morning; has been uneasy to-day, from some difficulty of swallowing; tongue cleaner. — Haust. anodyn. ut antea.

17th. — The friction on the hypochondriac region has completely removed the skin; has no pain at all on pressure, but there is evidently a considerable enlargement on the right side; pulse 100; tongue foul; mouth not sore; bowels regular, and stools natural; has lost the cold sweat entirely, and the subsultus tendinum is quite removed; his appetite is likewise improving; swallowing better. — Cont. ut antea.

19th. *Evening.* — There are evident fulness and hardness over the liver, on the right side, with a slight œdema of that part; had three large, natural stools since morning; feels himself quite comfortable and easy; he walked up and down a little in the ward. — Cont.

21st. — Did not sleep well; rejected the opiate last night; complains of irritability of stomach these last few days; feels very weak; pulse 85, full and soft; skin natural; tongue cleaner; no pain; very little appetite; had a free evacuation last evening, and one in the night, of a dark colour; pulse full and quick; skin cool, but not moist; tongue much cleaner; mouth affected by the mercury; feels particularly weak and low-spirited. — Cont. R Acid. nitros. ℥ij.; aq. puræ, ℥vj.; acid. muriat. ℥ij.; aq. ℥vj. M. Add ℔ij. aq. Fiat lotio sæpè utenda.

22d. *Evening.* — Pulse much accelerated, 120 in a minute; considerable ptyalism; mouth very sore; no pain; feels low-spirited; no effect from the nitro-muriatic wash. — Elix. paregor. ℥ss.; sp. æther. nitros. ℥xxx.; aq. puræ, ℥ij. M. ft. haust. h. s. s.

23d. — Pulse the same; perspired freely in the night; warm perspiration; tongue this morning clean, but rather dry, and a white streak on each side; the draught made him sick; slept well, and feels generally better; tumour the same, and it does not seem to point externally; no pain; bowels regular. — Cont. med. et lotio nitro-muriat.

27th. — Slept well; pulse exceedingly quick, irritable; bowels regular; tongue dry; the tumour very little altered, no pain at all, and no appearance of its pointing externally; and, under the present state of the case, an operation is out of the question. — Cont.

29th. — Pulse excessively quick, upwards of 120 in a minute; seems to be oppressed in his breathing, but has no pain; feels an indescribable languor; bowels open; stools natural; tongue clean and moist, but looks as if the skin had been removed by scalding, with a smooth, shining appearance. — Cont. ut antea.

30th. — He got up this morning to go to stool, and suddenly lost his sight; he now complains of great confusion in his head, and the sensation, while speaking, as if cannon were being discharged; skin cold, with a cold dew upon it; the tumour is very much increased and extends down to the umbilicus, but no pain at all on the severest pressure; tongue dry. He died the following day at 3 P.M.

Examination three hours after Death. — A large abscess was found in the liver, filled with watery and curdled matter, containing about ninety ounces; the whole parenchymatous substance of the right lobe was destroyed, and a complete cyst formed, with a membranous lining. Adhesions had taken place about the sixth or seventh rib only, but the tumour extended to the umbilicus; and therefore, if we had been disposed to open the abscess, we should have opened it about two or three inches from the ribs, as the most depending part of the tumour, (and we did perform the operation after death, and before the parietes of the abdomen were divided,) but as we were apprehensive that there was not any adhesion between the liver and peritonéum at this part, we would not attempt the operation lest the matter should escape into the cavity of the abdomen, which it certainly would have done if the operation had been attempted. The gall-bladder was not particularly full, but the common duct was much compressed and obstructed by enlargement and hardening of the pancreas, which completely enveloped it; and on laying the ducts open, we found at the mouth of the gall-bladder a considerable thickening and cartilaginous band constricting this part: the bile could not be pressed through the ducts. The small and large intestines were sound, both internally and externally.

Remarks. — It will be observed in the details of this case that ptyalism supervened, notwithstanding the previous existence of abscess, — a circumstance of very rare occurrence. The operation of opening the abscess was not attempted on account of the absence of the usual signs of adhesions to the abdominal parietes. If it had been performed, the extent of disease, and the very reduced state of the patient, precluded all hopes of advantage from it. The complication of diseased pancreas and abscess of the liver is deserving of notice; and more particularly the absence of jaundice, although the common duct seemed completely obstructed from the pressure of the enlarged pancreas: the obstruction, however, could not have been complete, as the stools were tolerably natural.

CASE XCIV.—*Abscesses of the Liver, with Inflammation of the Stomach, and Ulceration of the Cæcum and Colon. — Examination.*

WILLIAM HARRIS, ætat. 43, has been in India twenty-five years; admitted 9th March, 1817, at Kurnool. Complains of vertigo; weakness in knees, from rheumatism; pulse 84; tongue white and dry; his health has been impaired for some time, but his present symptoms commenced yesterday. Apply twenty leeches to the temples immediately; afterwards give an emetic. Fifteen grains of calomel, with five of pulv. antimonialis, at bed-time. The saline mixture every two hours, and the purging enema early in the morning.

10th. — The stools are watery, green, and mucous, with slight straining; skin cool; giddiness nearly gone. — Continue the calomel and antimonial powder, and the saline mixture.

11th. — Stools crude, feculent; feels very weak; pulse 88, full and strong; skin moist; fluttering about the scrobiculus cordis; no pain in the right side or belly; complains of weakness in the knees; tongue clean, smooth, and chopped, indicating obstructions and disease of the liver. — R Pil. hydr. cum cal. et pulv. antim. no. 1. three times a day. Mist. amar. cum sennâ, ʒij.; et sulph. magnes. ʒj. mane. Haust. anodyn. h. s. Apply a blister to scrob. cordis. Sago diet.

13th. — Tongue dry, chopped; stools more natural; feels general uneasiness over the limbs; pulse good. — Pilul. hydr. no. 1. nocte maneque. Cont. mist. amar. cum sennâ. Nitrous acid drink.

14th. — Bowels much better; tongue as before; pulse 78; skin cool; complains of exhaustion from the excessively hot weather; stools of the appearance of blood; no pain in the belly; general uneasiness; tongue moist, cleaner. — Cont. med.

15th. — Tongue moister and quite clean, still chopped; stools have the appearance of blood, but no fæces, and indicate a disease of the colon, observed amongst hard drinkers, viz. an excoriated and ulcerated internal surface; complains this morning, for the first time, of pain in the right side, immediately under the cartilages of the ribs and upwards, which affects his breathing; pulse 80, full and soft. — Cont. frictio, et mist. Repet. pilul. hydr. cum cal. four times a day. Cont. nitrous acid drink.

Vespere. — Stools somewhat feculent; feels a general sensation of heat; thirsty; pulse accelerated; troubled much with flatulence; tongue dry. — Mist. salin. febrif. Repet. pilul. ut antea. Cont. drink.

16th. — Has a severe stitch in the side; stools the same as yesterday, bloody,

without fæces; tongue as before; pulse 80, irregular. — Apply eighteen leeches to the side. Cont. med. ut antea.

17th. — The leeches removed the pain in his side; stools the same as yesterday, with some scybalæ; tongue as before; sleep indifferent; pulse 84; skin cool, moist. — Mist. purg. Enema. emol. Cont. omnia.

18th. — Stools with very little fæces; tongue unaltered; no pain in the side. — Repet. enema. Pilul. cal. cum aloë. ter die. Cont. mist. amar. cum sennâ, ut antea. Haust. anodyn. h. s. s.

No alteration in the symptoms or treatment took place until the 24th, when the tongue was clean and moist; stools watery, with fæces; skin covered with cold sweat; great debility. — Acid drink. Cont. pilul. bis in die. Haust. anodyn. Repet. haust. amar. cras mane.

25th. — Stools more feculent; pulse regular; body covered with sweat; slept well last night. — Cont. pilul. Decoct. cinchon. cum acid. sulph. ter in die. Haust. anodyn. h. s.

29th. — Very much oppressed by the heat; great oppression at the præcordia; breathing difficult; pulse languid; profuse sweat. — Haust. anodyn. h. s. Cont. the bark. A little wine occasionally.

31st. — Stools watery, of a red colour, with muddy sediment, and no fæces; tongue dry, rather parched; pulse soft and full; oppressed by the great heat. — Cont. omnia.

April 1st. Vespere. — Much flatulence; there has appeared since morning a large tumour in the region of the stomach, as if it were filled with air, but not painful on pressure; tongue dry; pulse weaker; appears to be losing ground. — Haust. anodyn. Rub the stomach with vol. linam.

2d. — Sinks rapidly; stools passed in bed; singultus for the first time; tongue continues dry; pulse quick, smaller; the whole abdomen much inflated, without pain or uneasiness.

Expired about 4 o'clock, P.M. of the 3d.

Sectio Cadaveris. — A small quantity of bloody serum was found in the cavity of the thorax. The liver was of a prodigious size, and occupied the whole of the epigastric and iliac regions. One abscess was found on the concave surface of the right lobe, near the gall-bladder, very superficial; and another on the concave surface of the left lobe, connected with the stomach. The gall-bladder was full of a pale, greenish-yellow bile, and as large as the urinary bladder when filled with urine. The stomach was considerably inflamed, particularly about the cardia, both externally and internally, and

the part of the stomach where the abscess was attached had the appearance of ulceration, and was of a greenish colour: this occupied about one third of the organ. On examining the gall-bladder more closely, we found all the ducts very much enlarged, but not obstructed. The entrance into the duodenum was quite open, and admitted a common-size probe to pass into the gall-bladder. The right lobe of the liver was a complete bag of matter, there being five distinct abscesses, each of which contained nearly a pint of pus, partly well formed, thick, and white, partly watery and coagulated, and part was of a yellowish-green hue, as if mixed with bile. The small intestines were generally of a dark-bluish colour. The ilium was preternaturally small, and towards its insertion into the cæcum shewed a considerable degree of red inflammation. The internal coat of the caput cæcum was a thick, hard slough, like moist leather, and hung in shreds. The great gut was covered with spots, of a dark-purple colour, and the villous coat much softened. This intestine presented several spots of a dark-purple inflammation in the external surface. The heart appeared quite sound, and the pericardium contained its usual quantity of serum.

CASE XCV.—*Ulceration of the Liver and Duodenum; Diseased Colon; Hydatids in the Kidneys; Introsusceptions, &c.*—(See Plate XVII. fig. 3.)

WILLIAM GILDING, ætat. 18, a sickly lad, a recruit, just arrived from England. Had bad health on the voyage, and has been constantly sick since his arrival in India. On his admission, 2d December, 1816, the testicles were enlarged, and he complained of pain of the side. Leeches, blisters, purgatives, and other remedies, were exhibited with very little benefit. He discharged several pieces of membrane, like the covering of hydatids, with some blood, by stool. He has lately complained of sharp pain in the right iliac region, where a small circumscribed tumour was observable. A seton was inserted, poultices applied, and mercurial frictions were employed. The pain and tumour have been since diminishing, and the alvine evacuations have become natural; but his strength is declining, and he has rapidly emaciated. He has been taking the pilul. hydr. cum calom. et pulv. antim. during the day, with the bitter aperient draught every morning.

January 1st.—Feels better; the pain and tumour both diminished; stools more natural; pulse good, and tongue clean.—Cont. ut suprâ.

3d.—Pulse 96, small; tongue clean; dejections copious, natural; feels pain about the anus when he goes to stool.—Cont.

5th.—Pain in the loins; tongue white; dejections copious.—Appl. hirud. parti dolenti. Cont. pilul.

7th.—Tongue white, rather dry; dejections copious, very offensive, of a pale-brown colour; no pain, either in the iliac region or in the back.—Mist. purg. Cont. enema.

10th.—Dejections crude, purulent, with undigested food; feels great uneasiness about the anus, but no pain in the iliac region.

12th.—Dejections sufficiently copious, perfectly natural; great pain about the anus, but the pain in the iliac region is quite gone.—Cont. pilul., frictio, et haust. amar. cum sennâ. Lotio opiata ano.

13th.—The medicine operated well; belly still full, but softer; dejections copious, feculent, mixed with mucus; no pain, except in the anus, which appears of a blue colour, as if about to sphacelate; the opiate has cooled and relieved him much.—Pulv. purg. Cont. pilul. Friction over the tumours of the iliac region.

Vespere.—Dejections bilious, feculent; tension of the belly subsided; pulse small, weak; great pain about the anus.—Cont. lotio opiata. Repet. med.

14th.—Dejections natural, with flakes of mucus; great pain from hæmorrhoids.—Cont. med. Has had sago and milk for diet for the last six days.

17th.—Dejections feculent; pain in the loins, immediately under the kidneys; urine very deep coloured; hæmorrhoidal tumour very painful.—Apply ten leeches to the loins, and warm fomentations. Haust. anodyn. Enema purg. cras mane.

18th.—Dejections perfectly natural in every respect; pain of the loins relieved by the leeches; pain from the hæmorrhoids continues.—Apply six leeches to the hæmorrhoids; afterwards a poultice. Repet. haust. et enema.

20th.—Dejections natural, with hardened fæces; pain in the anus easier.—Cont.

21st and 22d.—Pain in the anus much easier; dejections natural.—Cont.

23d.—Dejections copious, natural; hæmorrhoidal tumour diminished, still painful; no pain in any part of the belly or side on pressure, after strict examination.—Apply four leeches to the hæmorrhoids.

24th and 25th.—Dejections quite natural; less pain about the anus.—Cont. Fowl for diet.

28th.—Feels a disposition to relieve his bowels without the power.—Haust. amar. et senna, cum aquâ ammon.—Cont. haust. anodyn.

31st.—Complains of excessive pain in the loins.—Appl. hirud. xij. parti dolenti.

Vespere.—Pain in the right iliac region abated since the application of the leeches; some difficulty in making water.—Foment the belly. Enema.

February 1st. — Complains of severe cough since last night; countenance altered; pulse weak, and indicating great irritation; tongue clean; bowels regular; dejections perfectly natural; makes water freely, without pain. — *Haust. anodyn. cum opii, m℥. ; spirit. æther. nitros. ʒj. ; aquæ ammon. m℥xxx. pro re nata.*

2d. — Appears to be sinking, although there is no disease of a distinct character; complains for the first time of a sore throat; pulse frequent. — *Haust. anodyn. h. s.*

Died on the evening of the 4th.

Sectio Cadaveris. — The liver was nearly of a natural colour, rather darker than usual, and somewhat enlarged. The small intestines were of a bluish-grey colour; their coats were much thickened, and in many parts constricted. The ilium particularly was much contracted, of a lighter colour than the jejunum, and suffused with a blush of red. In the jejunum there were found two intussusceptions; the first about four feet from the duodenum, the second and most considerable about eleven inches further; the intussusceptions were downwards. On removing the small intestines, a strong adhesion between the liver and colon was observed. On separating these viscera, we were surprised to find the structure of the right kidney completely destroyed, and its substance converted into a bagful of hard lumps, of a yellow, cheese-like matter. The ulcerated cavity had not penetrated the colon, but a large ulcer was found on its external coat, forming a portion of the cyst which contained the matter above mentioned. The abscess, or rather the ulcerated cavity, penetrated the duodenum; and through the opening, we conceive those membranes which were discharged by stool in the course of the disease had made their way to the rectum, as there was something of a similar kind formed in the excavated kidney. The excavated cavity or abscess communicated with the inferior concave surface of the right lobe of the liver, which was also deeply ulcerated (see Plate XVII. fig. 3). The ulceration also penetrated the diaphragm, and extended into the inferior part of the right lobe of the lungs; so that the lungs, diaphragm, liver, duodenum, and colon, adhered to the kidney. The kidney contained some membranous matter, not unlike hydatids; they were not globular, indeed, but had somewhat the appearance of an hydatid when broken. The adhesions mentioned prevented the escape of the contents of the cyst into the abdominal cavity; whatever went from it passed into the duodenum, and proceeded through the alimentary canal in the usual way. The opening of the tumour into the duodenum was within three inches of the ductus communis choledochus, which probably gave the yellow colour to the contents of the cyst. The ducts were perfectly open, and the liver seemed capable of performing its functions. The colon was white, opaque, and much contracted throughout. At the descending colon and sigmoid flexure, the most extraordinary convolutions and distortions were observed. On laying

open the colon, its structure appeared to have undergone no important change. The whole gut was in a healthy state; but there was considerable thickening and congestion in the rectum. The substance forming the adhesions of the right kidney to the different parts was possessed of a cartilaginous firmness; we may say that the whole external parietes of the ulcerated cavity were converted into cartilage. There were no adhesions in the chest, nor any appearance, farther than the extension of the ulceration through the diaphragm, that could account for the difficulty of breathing during the last two days of the patient's life. There were about two ounces of water in the chest, and the pericardium contained more lymph than usual.

Remarks.—The most urgent symptom in this case was excessive pain at the anus, and occasional acute pain in the loins. The tumour in the iliac region had almost disappeared for some time before death: was not the disappearance owing to the discharge of the contents of the cyst in the right kidney? The disease in this case must have been of long standing; it was obviously beyond the aid of medicine. The dry tongue is always indicative of great visceral derangement,—generally of organic change, as it was observed in this case.

CASE XCVI.—*Illustrating a frequent Form of Abscess.*—(See Plates VII. and VIII.)

—JUNTIMAN. This man was sent to the general hospital at Madras from an out-station, and died the day after his arrival. He brought no account of his case, further than that he was labouring under dysentery: the previous existence of liver disease and presence of abscess were evident the few hours he was under our care before death. The case is given here, chiefly on account of its furnishing a beautiful specimen of a very frequent appearance when abscess supervenes in the centre of the right lobe of the liver, and well illustrates various pathological states of the viscus in connexion with abscess.

Examination, four hours after Death.—The right lobe of the liver (see Plate VII.) rose up in a globular form into the right thorax. The surface was inflamed, mottled, or marbled, with large spots of a yellow, red, brown, and reddish-brown tint. Upon making a transverse section of the right lobe, an immense abscess was divided, containing fluid, healthy pus. The substance of the liver was impacted, inflamed, and stretched around the purulent collection. The parietes of the abscess consisted entirely of the substance of the lobe, without any distinct cyst interposed between it and the purulent matter. The internal surface of the cavity of the abscess presented a smooth, mucous tissue, insensibly passing into the condensed or impacted parenchymatous structure. (See Plate VIII.)

CASE XCVII. — *Abscesses of the Liver; diseased Pancreas obstructing the Ducts; ulcerated Colon; Prognosis.—Examination.*

Madras, Aug. 16, 1821.—Dr. J—— had been ill for many months, and about a week before his death we were called to see him. He was confined to bed with dysentery. But, on examination, we were decidedly of opinion that the liver was the primary seat of disease; and that the dysenteric disorder, which had arrived at its most advanced stage, had arisen from this source. The extent and complications of disease precluded all hopes of benefit from medicine. He died in the night of the 15th. The body was examined by us on the following morning at seven o'clock, in the presence of several medical men: and as there had been some difference of opinion regarding the nature of his malady, we gave in the following statement of our views of the extent of disease before the body was examined:—"The liver is generally diseased, perhaps enlarged, and an abscess or abscesses formed in it, and deep-seated. Although he has had no very conclusive symptom of abscess, yet, from weighing every circumstance, it seems very likely that it actually exists. There can be no doubt as to the presence of organic disease of the liver, with congestion. The gall-bladder is most probably full of thick, ropy bile: there are evidently obstructions of the ducts, and very probably enlargement or knotty tumours of the pancreas and about the duodenum, occasioning these obstructions. Morbid adhesions will be found about the stomach and small intestines: the former will be most probably inflated, and its villous coat more than usually vascular; the latter may be vascular, but not inflamed. The large intestines will be found particularly diseased, of a dark colour externally, and ulcerated internally."

The appearances on Examination.—Two distinct abscesses were found in the liver; one on the superior convex part, adhering to, and forming adhesions with the diaphragm and lungs; the other on the superior lateral part of the liver, adhering to the ribs and diaphragm. The gall-bladder was half-full of dark bile, and the ducts compressed by knotty tumours and cellular adhesions. The ducts were pervious, except where these tumours pressed upon them; and here the probe met with decided resistance, and the bile did not pass without considerable pressure on the gall-bladder. A considerable quantity of coagulable lymph was found spread over the liver, and adhering to the side, and in the neighbourhood of both abscesses. The stomach was not particularly inflated. The cardiac orifice was of a peculiar dark colour, evidently owing to venous congestion; and the whole internal coat was highly vascular, but presented no marks of active inflammation. The duodenum had the same appearance

as the stomach. The jejunum was inflated and empty. The ilium pulpy, contracted to a very small size, and soft. The omentum a complete mass of fat. The colon of a dark colour externally, with ulcerations through the coats, from which the contents had passed into the pelvis.

Remarks. — The reader will observe the nearly exact coincidence between the statement given by us before the examination and those lesions which were actually found. The very few days before his death on which we saw him, prevented us from taking farther notes of the case than what we have now given.

CASE XCVIII.—*Abscess of the Liver, with cartilaginous state of the Parietes of the Abscess, and Hardening of the Liver.*

— WOOD, 59th Regiment, died on the 5th January, 1817. He had suffered long under sub-acute hepatitis, to which dysentery had supervened, with the symptoms of abscess of the liver and pulmonary affections, without any appearance of external pointing of the abscess. Upon examination of the body, the liver was found extending across the epigastrium, filling both hypochondria, and pressing down the stomach. It was of a very dark reddish-brown colour, and adhered firmly to the diaphragm and right side, high under the ribs. On attempting to separate it from the side, a large quantity of purulent matter burst out, and a most extensive abscess in the right lobe was displayed. It appeared to have been of long standing, from the circumstance of the parietes of the abscess having been changed to an almost cartilaginous state. The inner surface of the walls of the abscess was white, hard, and perfectly cartilaginous; and the whole structure of the organ was hard, gristly, and was cut with difficulty. The inflammation had extended to the diaphragm, and to the right lung, which was shrivelled, much diseased, and adhered firmly to the side. Some bloody fluid was effused in the right chest. The gall-bladder contained a little dark-green, ropy bile. The small intestines were sound: the large bowel inflamed in its internal surface.

CASE XCIX. — *Former Abscess of the Liver, leaving a Cicatrix; Vomicæ in the Lungs.*

A MAN was admitted into the Madras hospital on the 19th May, 1819, in the advanced stage of phthisis. His countenance sallow; his eye having a pearly appearance, with an expectoration of greenish mucus and pus. His bowels were greatly disordered, and the stools morbid. His complaint was considered, from the existing symptoms and the account he gave of himself, as the termination of hepatitis in abscess opening into the lungs.

Upon Examination, the right lung was found adhering to the surrounding parts, and containing several small vomicæ. There was also some effusion of serum in the intervals between the adhesions in the right thorax, and also in the left cavity. The liver was much enlarged, and presented the appearance of a cicatrix near the inferior part of the right lobe, of a light colour, and evidently marking the previous existence of an abscess, which must have been absorbed. The gall-bladder was unusually small, and contained a little reddish-yellow bile, which, when mixed with water, gave it a muddy appearance. The heart was unusually small.

Remarks.—It is evident that the disease of the chest was here consequent upon abscess of the liver, and that the purulent discharge from the vomicæ in the lungs had acted as a derivative agent upon the purulent collection in the liver, and occasioned its absorption.

CASE C.—*Hepatitis supervening to Dysentery, and terminating in Abscess.*

M'MAHON was admitted July 24th, 1806, with dysentery. He made no complaint of his side, and felt no uneasiness upon a strict examination of the region of the liver. Mercurial purgatives and sudorifics were administered; the dysentery yielded; but soon after, he had symptoms of hepatitis,—pain in the side acute, breathing difficult. Bleeding, warm bath, blistering, and mercury, were used. The disease terminated fatally in suppuration. The abdomen being opened, the vessels of the omentum were seen distended with blood, so as to give it a red appearance: upon removing this, the intestines were found sound externally, but were not examined internally. Having raised the sternum, an abscess was discovered at the inner and upper part of the convex side of the liver, nearly where the suspensory ligaments pass, betwixt the right and left lobe, containing eight or ten ounces of pus, though it was not full, for some had escaped into the cavity of the abdomen; there was an exudation of coagulable lymph on the surface, which adhered firmly to the diaphragm. There were other adhesions, and the peritoneum surrounding the liver had the appearance of being inflamed. The liver was large, filling the right and left hypochondria; and on removing it, another equally large and *distinct* abscess was discovered in the centre of the right lobe, surrounded by thick walls, and having no connexion with the first.

SECTION IV.

Of the Treatment of Inflammations of the Liver.

THIS is one of the most important subjects which a writer on the diseases of India can entertain. It is one also respecting which considerable diversity of opinion exists,—not so much as to the remedies which are requisite to the removal of these diseases, as to the extent to which they may be employed, and the period or stage of disorder and particular circumstances under which they are most applicable. In order to give greater precision to our observations, we shall consider under separate heads the treatment suited to the more active, and more chronic forms of hepatitis; and view the most efficient means which should be prescribed for their removal, in relation to the various circumstances in which we generally are required to employ them in India, and indeed in all climates. The difference of treatment necessary in these diseases, as occurring in warm countries and between the tropics, does not consist in the kind of remedies required, but in the extent to which they must be carried in a short time, and the promptitude with which they ought to be prescribed upon the first appearance and development of the symptoms. In all cases the practitioner should not wait for disease of the biliary organs becoming more distinct and more marked: if he see but a single sign of excitement in this part of the economy, he should resort to active measures, anticipate the disease which is about to burst forth, and by meeting the coming evil, entirely avert it. This is the more necessary, as the most dangerous form of hepatitis, namely, that seated in the internal structure of the liver, often proceeds with a silent activity to an almost irremediable length, without evincing a single acute symptom. The practitioner, in such cases, should never be deterred by fears of debility or exhaustion supervening to the measures which are called for: he should always recollect, that Europeans, resident in warm countries, generally live too fully for the climate; that a plethoric state of the vascular system generally, and of the portal system

of vessels in particular, is the pathological condition which most generally obtains, especially in India; and that this state, whether it be related to acute hepatitis, dysentery, functional disorders of the liver, or different types of fever, can be removed with sufficient celerity to prevent fatal consequences only by vascular depletions and other evacuations: after the accomplishment of this object, the secretions of the large viscera may be promoted and corrected by suitable medicines, and the diet and regimen properly assigned.

Amongst the lower classes of Europeans in warm climates, particularly among soldiers, the habits to which they are more or less accustomed, and the length of time they have resided in the climate, should always be kept in mind by the practitioner, both as relates to the nature and extent of their diseases, and the remedial means employed. Amongst those who are addicted to the use of spirituous liquors, venesection is not so well borne as amongst the temperate and those of regular habits; and when it is necessarily put in practice, the exhibition of stimulants is often also required. But still, as we shall immediately shew, this effect of intemperance in restricting the use of depletions, is by no means so general as many suppose; and even where venesection cannot be attempted, local blood-lettings may be employed with advantage.

The time of residence in an intertropical climate is another point which should always be considered as particularly influencing the treatment, and modifying the character, of the disease; but it should no farther affect the former than in as far as it has effected the latter. The state of the economy, as respects vigour, vascular energy, and excitement, viewed with a due reference to the various circumstances of disease, constitution, and means of reparation, should be the real basis on which we ought to found our opinions as to the extent to which particular means of cure may be carried.

The prevailing character of the seasons, and the endemic peculiarities or circumstances of locality, ought also to have a considerable influence upon the choice of particular remedies, and the length to which they may be pushed; but this particular consideration, although deserving attention in

hepatic diseases, is much more important in the treatment of those maladies which will be embraced in the second volume of the present work. In all cases, the circumstances external to the patient, but acting upon his system, and those which are intrinsic, as regards his former state, his existing condition, and the extent, duration, and nature of his malady, should be fully considered, and the remedies, according to what is known of their operation, prescribed in accordance with the views which a careful examination of all the circumstances have led us to entertain. Directed in this manner, our practice will be the result of a rational induction from what we know of the nature of disease, and the effects of remedies; and if we err, we do so with the consolation that our endeavours to avoid error were supported by the science and experience of our predecessors and contemporaries, and were exercised to the best of our abilities.

SUB-SECTION I.

Of the Treatment of the more Active Forms of Hepatitis.

Blood-letting, general and local.—This is the most valuable of all the means which may be employed in the treatment of the various forms of hepatic inflammation occurring within the tropics; yet it is one which is by no means so extensively resorted to by many practitioners in India, even in the more active forms of the disease, as in our opinion it ought to be. This circumstance, and the necessity of combating the ideas many entertain respecting active vascular depletion, will be our excuse for entering upon this particular topic with considerable earnestness. We can truly say, as respects the different forms of inflammation of the liver as they occur in India, that we have had occasionally to regret not having practised blood-letting when it might have been attempted with hopes of success, or carried it sufficiently far to be really beneficial; but we have never found that mischief resulted either from its performance, or the extent to which it had been

pushed. Numerous instances, on the other hand, have come before us where,—from early education, the indulgence of prejudices, an indifference to the examination of those who have died of this class of diseases, and, consequently, from an insufficient acquaintance with the nature and extent of disease which occasioned death,—sufficient vascular depletion had been neglected at that stage of the malady when it might have been most serviceable, and the formidable consequences of disease prevented.

The European practitioner in India enjoys very great advantages in the abundance and excellence of the leeches of the country. With these, vascular depletions may be made locally to any extent, with a promptitude equal to venesection; and, amongst the greater number of those upon whom he will be required to practise, leeches may be used with more advantage than blood-letting from the arm. Venesection is, however, very urgently required in the present forms of hepatic disease amongst full-blooded and robust persons who have recently arrived in the country, particularly those of a fair complexion and sanguine temperament; but in those, local depletions are also often necessary. From the very numerous experiments made by us, in order to ascertain the quantity of blood drawn by the leeches of India, we have found that, one with another, they take away nearly one ounce and a quarter of blood each, independently of what escapes afterwards. The application, therefore, of from eighteen to thirty leeches, is equal to a full depletion from the arm, with the advantages of being near to the diseased organ, and of not producing so much exhaustion of the system as an equal quantity abstracted from a vein. These circumstances have generally induced us to take blood locally in the various forms of inflammation of the liver, proportioning the quantity abstracted to the particular circumstances of the disease and of the patient.

In the more active forms of hepatitis occurring in the plethoric and robust, more particularly those who have recently arrived in India, one or two full blood-lettings should be performed; and the first operation should be carried so far as to produce a very marked effect upon the pulse and the heart's action, without regard to the quantity abstracted. After this effect has

been produced, the increased vascular action generally returns after a few hours. When this occurs, then the application of from sixteen to thirty leeches over the right hypochondrium and epigastrium will prove most beneficial. If the individual be robust, and not much reduced by these depletions, and the symptoms be not materially relieved after a few hours, the above number may be repeated, and, after the bites have been stopped by the application of any styptic, such as the muriated tincture of iron, a large hot poultice may be placed over the situation where the more urgent symptoms were experienced, and frequently renewed. The bleeding from the leech-bites should always be arrested before the application of hot poultices, as there may be some difficulty of doing so afterwards, and because it is much better that an ascertained quantity of blood should be withdrawn, than an indefinite loss of this fluid be occasioned by allowing the bleeding to continue afterwards. The advantages of poultices at this time are very great, particularly when the hepatic disease is complicated with a morbid condition of the biliary secretion and a dysenteric state of the bowels: they remove the tension and pain felt in the region of the liver and throughout the abdomen, promote the determination of the circulating fluids to the surface of the body, and equalise the distribution of the blood.

It will not often happen that more than one depletion from a vein is required, when the first is made with sufficient promptitude, and carried as far as it ought. In plethoric individuals, however, the inflammatory action going forward in the substance of the liver is often attended with great congestion and tumefaction of the organ, and with an oppressed state of the pulse. In these, the first depletion will sometimes produce faintness before a sufficient quantity is taken, the blood abstracted being very dark, thick, and oily, with a glutinous state of the serum; and vascular action, which was heretofore oppressed and laboured, becomes more violent and less embarrassed. When this takes place, a fuller depletion from the arm is required, and the patient generally can bear it better than he did the former; it generally, also, gives more relief,—the blood becoming now more florid, and exhibiting either, for the first time, the buffy coat, or more of this appearance than it did before. But as long as the tongue remains excited, and pain,

anxiety, or tension, are complained of upon pressure, local depletions ought to be prescribed, and followed by internal remedies calculated to act upon the biliary and intestinal secretions, and to carry them off from the system.

One or two full depletions having been thus made with promptitude, even the most plethoric and robust will seldom require more than local depletions afterwards. These should be resorted to, if any of the symptoms seem to require depletion, and if the state of the patient admit of it. In those cases of the more active form of hepatitis which are attended with considerable tumefaction at the epigastrium and hypochondrium, owing to congestion or enlargement of the liver accompanying, or supervening to, the inflammatory condition, the repeated application of leeches to the seat of tumefaction, even after one or more general blood-lettings, is often most serviceable, and tends more to remove this state of fulness and enlargement than venesection carried to the utmost limits. In all such cases, as well as in those which we are about to take into consideration, the institution of local depletions, followed in some cases by poulticing, in others by blisters, and in others by the nitro-muriatic wash, and repeated or carried as far as circumstances may require, is one of the most efficient means of cure that can be possibly prescribed. In many of those cases, and in such more particularly as are characterised by congestion, by an oppressed and labouring pulse, an excited and foul tongue, and much disorder of the alvine evacuations, the blood abstracted by the leeches is of a very dark colour and thick consistence. Sometimes it has the appearance of tar, with considerable viscosity. These states of the circulating fluid have long particularly struck us as being characteristic of a particularly low condition of the vital energies of the system, accompanied with congestion and a loaded state of the portal vessels: they could not have been the result of changes which the blood had undergone during the short time of its remaining in the stomach of the leech; inasmuch as similar appearances of this fluid are not met with in cases of local depletions employed during different conditions of the system, when the blood is in a healthy state, and the functions of the liver duly performed. In many of the cases wherein this morbid state of the circulating fluid was apparent upon local depletion, we have found it necessary to exhibit internally diffusible

stimuli, at the same time that we removed the vascular load by which the portal vessels seemed to be oppressed, and endeavoured to rouse the languid powers of secretion, and restore them to their healthy office.

In the less active forms of hepatitis, local depletions, accompanied with the other remedies which we shall presently point out, are generally all that is necessary. In debilitated patients the number of leeches applied should be small, and repeated after two or three days. Each application may be followed by poultices, as we have already directed, by blisters, and lastly by the use of alterative courses of mercury, or by the nitro-muriatic wash; or, instead of these latter, by the nitric acid taken internally. The repeated application of leeches on the right hypochondrium, in those chronic cases which are attended with enlargement of the viscus, with obstructed secretion, and a disordered state of the bowels, ought never to be neglected, and the diet and regimen of the patient should be strictly attended to. In these, great discrimination in the choice of remedial means is necessary, and should be exerted with a strict relation to every particular circumstance of the case.

When hepatitis occurs amongst those who have resided long in India, or in other warm climates, local depletions, by means of leeches or by cupping, will often be sufficient, even in its more acute forms, if practised with sufficient energy. If the leeches be not equal to those which are so abundant in India, the number applied ought to be in proportion. In almost every case, leeches are preferable to cupping; for the pressure of that number of glasses which are requisite to the abstraction of a sufficient quantity of blood, is productive of so much pain, as to aggravate the disease in some instances. More than double the number of European leeches will not equal in their operation the leeches of India. This circumstance ought to be kept in recollection when estimating the extent of the local depletions prescribed in the cases detailed in this work; and it accounts for the comparative infrequency of general blood-letting in the treatment of them. In weak and worn-out constitutions, local depletions must be directed according to the particular circumstances connected with the patient, which may come to the knowledge of the practitioner, and the activity of the symptoms present: these particulars he

ought to make himself fully acquainted with, and should deplete accordingly; remembering that in those constitutions, the application of leeches will prove most serviceable, and be quite indispensable, even when depletion from a vein, although to a very small amount, would not be borne, or would prove detrimental. In many of this class of patients we have found it requisite to prescribe the repeated application of leeches to the region of the liver, whilst we have been obliged to support the energies of the constitution by means of gentle tonics, a mild nutritious diet, and, occasionally, diffusible stimulants.

One class of patients will frequently fall under the care of the intertropical practitioner, more especially the medical officer in India, requiring considerable discrimination in the management of their diseases, particularly those of the biliary apparatus, — we allude to soldiers who are addicted to the use of spirituous liquors, and who have resided for some time in a warm climate. In them we meet with hepatitis in every grade of activity, from the most acute to the most chronic: in them, depletions must be instituted with great attention and judgment. Unless the pulse possesses much volume and strength, general blood-letting is seldom so beneficial in this class of patients as local depletions, carried to a length proportionate to the particular condition of the individual, and extent and activity of disease. Amongst this class, leeches applied to the epigastric and hypochondriac regions are indispensable; but the total abstraction of the accustomed stimulus should not be fully enforced at the same time, especially in those who are frequently intoxicated, without the substitution of some safer stimulant. In patients of this description we have generally prescribed, in order that the necessary local depletions might be made with advantage, and without lowering too far the energies of the system, the spirit of nitric æther, the compound spirit of ammonia, the carbonate of ammonia, the opiated tincture of camphor, or the spirits of lavender; and allowed an occasional glass of weak punch, with as light and nutritious a diet as the digestive organs apparently could manage.

In that sub-acute form of inflammation of the substance of the liver which is attended with a very acrid and morbid state of the biliary secretions,

and which is frequently productive of inflammatory action of the mucous surface of the large intestines, and dysenteric symptoms, the employment of a large number of leeches over the right hypochondriac region, and, if the bowel disorder supervene, over the situation of the cæcum, is always most beneficial. The leeches should be repeated until the symptoms are relieved, and be followed by poultices, as already pointed out, or by a blister: at the same time, the morbid secretions should be evacuated, in the manner which we shall immediately recommend; and, after the inflammatory action has been subdued, the secreting functions of the liver and intestines ought to be restored to their healthy state by a short mercurial course. When tenesmus has supervened in this form of inflammation of the liver, we have generally applied from ten to eighteen leeches to the sacrum with advantage, both as respects the disease of the liver and this particular symptom. It would be an interesting inquiry to ascertain the comparative good effects of local depletions in other situations than in that more immediately in the vicinity of the diseased organ. We have generally preferred this latter, chiefly on account of the subsequent application of hot fomentations and poultices, as already alluded to; but we have no doubt that the practice of applying a number of leeches in the neighbourhood of the anus, as practised by French physicians, and lately recommended by Dr. Thomas of Cheltenham, Dr. Ballingal, and others, in all the forms of hepatitis and congestion of the liver, and more particularly when attended with dysenteric symptoms, is calculated to prove of great service. We have not ourselves enjoyed sufficient experience to enable us to speak decidedly as to the advantages of the practice, the prejudices of the majority of our patients having been a barrier against our resorting to it; but, as regards the application of leeches to the sacrum and os coccygis, we are enabled, from a most extensive experience, to speak most favourably.

It may appear, perhaps, incredible to many of our readers, after having perused the observations contained in the present volume upon the habits and modes of living of many Europeans in India, that there should be still found practitioners who espouse opinions unfavourable to the employment of vascular depletions in the hepatitis of India, and who place their sole reliance

upon the use of mercury or nitric acid for the removal of the disease. Yet such is the case; although we believe that the number is daily diminishing, and that more correct views are becoming very general. Many of those practitioners, however, reject depletions altogether, because they consider that the state of the patient does not admit of the institution of venesection; and as they believe that general depletion cannot be ventured upon, because of the state of the pulse and the spurious symptoms of debility present, so they overlook the fact, that, in the diseases of internal viscera particularly, local depletions may be performed, and even repeated, with the best effects, where venesection would be injurious, or, at least, of doubtful advantage. They also overlook an important circumstance connected with the state of the pulse, and of the energies of the system, frequently observed in hepatic diseases; namely, that the pulse may be weak and small, simply from congestion alone, or from this state accompanying the inflammatory action, and from the blood being determined to the internal viscera, and abstracted in an equal degree from the extremities and surface of the body; and thus, from its accumulation in these viscera, oppressing, but not altogether overwhelming, the powers of life. In almost all such cases the pulse rises, and the energies of the frame are restored by the local depletions, even when a general depletion, in some few instances, might not be borne well by the patient. This is a point most deserving the attention of practitioners in every climate; for to reject depletion altogether, because blood-letting from the arm may not safely be ventured upon, is as illogical in reasoning as it is most detrimental in practice.

Practitioners who reason against the employment of vascular depletions, and rest their sole hopes upon the early induction of the mercurial action in the system, support their opinions by reference to the peculiar nature of the hepatitis in India, and that it differs altogether from inflammations of this organ as observed in temperate climates, or in any other inter-tropical country. We allow the difference argued for, in some respects; but we by no means consider it to be so great as they are desirous of establishing. We well know that inflammation of the liver, when attacking chiefly its internal structure, is an extremely silent and insidious disease,

assuming often the appearance of dysentery, and characterised very frequently by disorder or obstruction of the biliary secretion. But we cannot believe that this particular form of hepatic inflammation, although a very frequent one in India, is altogether confined to that hemisphere. Practitioners of experience and observation have remarked similar forms of the disease in the western hemisphere, and even in Europe;* although they are much less frequent in these climates than in India. A somewhat similar complication of inflammation of the substance of the liver with dysentery has been often observed in Europe, more particularly in the warmer countries of this quarter of the globe, although the connexion was often not detected until upon examination after death. When we consider the very few bodies examined in the times of Sir John Pringle, Cleghorn, Lind, and Clark, and that abscess of the liver, and other organic changes, were frequently found in those who were examined after having died of dysenteric complaints, we must consider the connexion of the bowel disease with inflammation of the substance of the liver very intimate in the countries of Europe to which their inquiries were confined, if indeed the former disease did not entirely originate in and depend upon the latter. The observations upon the hepatitis of India contained in Dr. Saunders's classical work on the diseases of the liver, have tended much to encourage the opinion, that hepatitis is not only a more frequent disease in the eastern hemisphere than in any other part, but is also there distinct in its characters from the inflammations of the liver observed in any other quarter of the globe, and requiring a different method of cure. The only difference between the hepatitis of India and of other countries, we have already stated to consist in the more frequent affection, in the eastern hemisphere, of the internal structure of the organ, producing, from the low sensibility with which this structure is endowed, comparatively little disturbance of the system when it is in a state even of active inflammation, and still less when the inflammatory action is of a slow, sub-acute, or chronic nature, but occasioning marked disorder of the secreting function of the organ,

* See Portal, *sur la Nature et Traitement des Maladies du Foie*, pp. 569, 570, et passim. Pringle on the Diseases of the Army, &c. p. 221—224. Cleghorn on the Diseases of Minorca, p. 227.

and of the bile itself, and consequent disease in the alimentary canal, more particularly of the large intestines.

But as inflammation attacking chiefly the substance of the liver is not confined to India, or to tropical countries generally, as may be seen from the writings of Bonetus, Lieutaud, Pringle, Cleghorn, Clark, Portal, and Chisholm, so is the complication of this form of inflammation of the liver with disease of the bowels also extended to other climates and countries, whenever circumstances are present which are calculated to produce the original malady, and to favour the supervention of the consecutive disorder. The causes giving rise to disease of the substance of the liver and of the bowels, either in their separate or in their complicated forms of existence, are present in India in a very marked manner, particularly those to which soldiers and sailors are exposed: hence, in some measure, the frequency of their occurrence; but that they are also often present in a somewhat modified manner, and produce nearly similar effects, in both the western hemisphere and in the Mediterranean, has been sufficiently proved by the very numerous publications and papers upon hepatic diseases and dysentery, as observed in these parts of the globe, which have issued from the press during the preceding twenty years, both in Europe and America.

After this digression, made with a view of combating the opinions of those who suppose that depletions are not suited to that silent, insidious, and sometimes slow form of inflammation of the liver which is frequent in India, and which is often more or less complicated in the way already alluded to, we must return to the subject more immediately under consideration. We have already stated, that inflammation seated in the substance of the liver is attended very frequently with a morbid state of the biliary secretion, with tumefaction of the organ, and with an irregular state of the bowels, readily running into a dysenteric form, and constituting what is not improperly called hepatic dysentery. Let us for a moment advert to the almost uniform appearances met with upon examination of the fatal cases of this disease, as detailed in our observations, and in the history of the cases contained in the first and second sections of this chapter. Do not these appearances evince, in every

instance, either inflammation of the substance of the liver and large intestines, in almost every stage of its progress, or some one of its legitimate consequences? In what manner can this condition be removed, or any one of its effects prevented, but by decided antiphlogistic measures actively exercised at the commencement of the disease? No person who possesses just views of the operation of mercurial preparations upon the system, can suppose that the specific operation of this mineral will be readily induced in the system, during inflammatory diseases, before depletions have been instituted; or can doubt, if the use of this agent be persisted in before such depletions have been performed, that the irritable state of the pulse will be increased, and the supervention of abscess of the liver thereby promoted. We will not deny, that if the disease of the liver be of a chronic form, and occur in those who possess a languid or weak circulation, the mercurial action may be speedily induced, full ptyalism ensue, and the disease quickly removed; but if ptyalism be not soon produced, and the mercurial treatment be persisted in for too long a period, much serious mischief will often ensue, more particularly if any constitutional inaptitude to the specific influence of the mercury exist.

Mercurials, Purgatives, and Laxatives. — When describing the history and symptoms of inflammations of the liver, we stated, that in nearly all their forms, the biliary secretion is much altered in quality, and very frequently diminished in quantity; and that, in conjunction with this condition of the bile, the secretions poured out from the mucous surface of the intestinal canal, more particularly of the large intestines, are also of a morbid state. In order to remove these disorders, in addition to the depletory means already treated of, purgatives should be given, and repeated daily; so that further disease be not induced by the remora of the morbid secretions in any part of the bowels. For this purpose, we have generally prescribed, immediately after the first vascular depletion, a full dose of calomel, as this medicine appears to us the most beneficial in inflammatory states of the system, the most active in eliciting a healthy secretion of bile, and the most efficient in dissolving that viscid and tenacious secretion which covers the mucous coat of the intestinal canal at the commencement of nearly all the disorders affecting the organs of digestion. Unless the patient has come

under treatment early in the day, when we have given this medicine immediately, we prefer the exhibition of it at bed-time, as it will then not disturb the rest of the patient by its operation, and will have had time to produce its effects upon the secretions and secreting viscera before morning; when a brisk purgative should be given, in order to carry out of the system accumulated fæces, and those morbid secretions which the previous exhibition of the calomel had prepared for removal. One of the best cathartics for this purpose is the common purging powder, consisting of supertartrate of potash and jalap. This powder generally procures a full but not frequent evacuation, and produces less irritation of the mucous surface of the bowels than any other which can be employed. Next to it, we may recommend castor oil, or the common black draught, as it is usually prepared; or, what is yet better, particularly when the energies of the system are much impaired, the combination of the compound infusion of senna with the compound infusion of gentian, to which may be added some cathartic or laxative neutral salt, or the spiritus ammoniæ aromaticus, the spiritus ætheris nitricus, and any corrigent which the circumstances of the case may warrant.

In the treatment of diseases of the liver, as well as of other diseases, in warm climates, care should be taken not to disturb the rest of the patient by exhibiting purgatives so as to operate through the night. In cases where, owing to disorder of the bowels, the rest is thus disturbed, it should be the object of the practitioner to allay this disorder during the hours of repose, by means of an anodyne draught or enema, and to give a purgative powder or draught early in the morning. Even when it is our wish to continue the exhibition of full doses of calomel, they may be still given at bed-time, in conjunction with an anodyne draught or enema, without counteracting this intention; for calomel, given at night in a full dose, will seldom or ever operate before morning. There is nothing which tends to keep up the energies of the frame more throughout a long illness than the enjoyment of repose during the night; whilst, on the other hand, nothing tends more to lower them than frequent calls to stool during the hours devoted to repose. In many situations, also, within the tropics, especially where there is a free ingress of the night air, and when the nights are comparatively cold, damp, and

chilly, the patient is exposed to the most active causes of disease,—causes which, although they will not frequently induce a different disorder from that under which he is then labouring, will generally aggravate the symptoms, and heighten the danger from the one with which he is afflicted.

If the exhibition of twenty grains of calomel at bed-time, and a purgative in the morning, saline diaphoretics being given through the day, affect the mouth, which frequently happens when vascular depletion has been carried sufficiently far, ptyalism should be quickly induced ; but after its supervention, mercurials ought to be laid aside for a time. The reason of our recommending the speedy induction of ptyalism after the mouth becomes affected, is an idea which we entertain respecting the influence of the constitutional effects of mercury upon inflammations of the liver ; namely, that to induce the mercurial excitement of the vascular system, indicated by slight soreness of the gums, and to exhibit mercury or calomel in small quantities, frequently repeated with this view, is to keep up a state of slow inflammatory action in the secreting substance of the liver, which may of itself terminate in abscess ; whilst, if the full operation of mercurial remedies be speedily induced, and ptyalism become abundant, a derivation from the seat of disease is occasioned to the mouth and salivary apparatus, the disease in the liver speedily subsides, and the functions of the organ are restored to their healthy state. We believe that much evil very frequently results from the general habit of giving too frequent doses of calomel, with a view of inducing the constitutional effects of mercury. Those who prescribe five grains of calomel every three or four hours, with this view, produce much greater irritation of the alimentary canal, are longer in obtaining their object, and exhibit much more calomel for the removal of the disease, than those who give twenty grains only at bed-time. This latter dose acts as a sedative to the irritable stomach in this disease, whilst smaller doses increase the irritability of this viscus when it is present, and often induce it where it was previously absent.

Where much disorder of the bowels exists or supervenes during the course of the disease, the calomel may be given with one or two grains of opium, and as much powdered ipecacuanha, or an anodyne draught, exhibited at the same

time. In order also to sheath or protect, in such cases, the mucous surface of the large intestines from the irritating effects of the morbid secretions passing through them, emollient enemata should be thrown up, and the more gentle aperients given. When calomel has been exhibited in the manner now stated, it will often soon affect the system, in addition to its operation upon the functions of secretion, and upon the secretions themselves; and this will be induced with a celerity in proportion to the activity with which vascular depletions have been performed. But in many cases, particularly in those in which the symptoms disappeared quickly after blood-letting, the patient recovers so rapidly, that the exhibition of the calomel at bed-time is left off, the hepatic and intestinal functions having been restored to their healthy states, before sufficient time has elapsed to produce the specific effects of the medicine upon the system. Hence we were led to state, in our former work, that if the constitutional effects of calomel, when given in the manner here recommended, do supervene, the circumstance is to be considered as being favourable to the speedy removal of the disease; but to continue to give calomel, or to exhibit mercurials, after the secretions have been restored to their healthy state, and the symptoms of disease have subsided, is to occasion inordinate excitation of the functions of an organ which has recently suffered from disease, and which is but too prone to resume the morbid state.

When the gums become tender from the use of calomel, as we have recommended it, the speedy induction of ptyalism may be procured, if the symptoms indicate the propriety of the measure, but not otherwise. If the secretions have assumed a healthy character, and the signs of disease have vanished, then no further exhibition of mercurial medicines need be practised until the state of the bowels require them; and gentle tonics, with alteratives and saline aperients, may be given, in order to restore tone to the digestive organs, and promote the functions of the abdominal viscera. But if the secretions and stools still remain morbid; if any disorder can be detected, by a careful examination of the patient, in the seat of the liver or in the abdomen; if the tongue be not natural; and if the countenance be sallow or unhealthy,—the speedy induction of ptyalism will then often prove of service. If, however, we fail in inducing this effect in the course of four or five days, we shall generally find it detrimental to continue this plan any longer. The means by

which the speedy induction of the mercurial action may be accomplished are various; but we have generally relied most upon mercurial inunction, performed thrice a day, with a combination of camphor with the mercurial ointment, the patient taking the usual full dose of calomel at bed-time, combined with James's powder, or antimonial powder and opium. The combination of calomel with any of the preparations of antimony tends greatly to hasten the specific effects of mercurial medicines, particularly after blood-letting, and has generally been resorted to by us, either with this view, or to subdue febrile action. Any of the mercurial pills contained in the list of formulæ,* may also be given during the day, in order to promote the same end, and emollient enemata¹ thrown up, to allay any irritation which may supervene in the large intestines; whilst an occasional cooling purgative, or an aperient, should be taken, for the purpose of evacuating the morbid biliary and intestinal secretions which rapidly form in hepatic diseases, and which, if not removed from the bowels, would speedily induce ulceration in the situations in which they might, even for a short time, lodge. As soon as ptyalism has been produced by these decisive means, then the employment of all mercurial remedies should be intermitted, and gentle tonics, combined with the alkaline carbonates or with saline aperients, and a light, nutritious diet, ought to be prescribed. It is not necessary, in hepatic diseases, to continue this effect upon the salivary apparatus above a few days; for its influence upon the disease is produced in a short time.

The observations which have been now offered respecting the employment of purgatives and mercurials, have a stricter reference to the more active forms of inflammation of the liver. In the sub-acute and less active cases, particularly those which have been of somewhat long standing, or which have supervened to previous attacks of disease of this viscus, the use of deobstruent and saline aperients and purgatives, alternated with mild mercurials and alteratives, and occasionally with a full dose of calomel at bed-time, is generally most beneficial, particularly when local depletions have been employed with sufficient decision, and repeated as often as the circumstances of the case required. If these means fail of producing a decided influence over the disease, then the prac-

* See pp. 253—6

itioner should endeavour, in the manner stated above, to induce, as quickly as possible, the full effects of mercury, after the appearance of which mercurial remedies may be, at least for a time, laid aside.

When great congestion and enlargement of the liver accompany the inflammatory state, repeated leeching is generally requisite; and a regular and decided purgative course should be followed up. In these cases, however, saline purgatives, such as the sulphates of soda and magnesia, procure only watery stools, and harass the patient. If these be given, they should be combined with the compound infusions of senna, or of senna and gentian; and, if necessary, the tincture of jalap may be added. Purgative enemata may be also exhibited; and in order to emulge the biliary ducts, and by this means overcome the congestion of the organ, twenty grains of calomel should be given every night, until a decided effect is produced upon the disease. After the local depletions have been employed, and the inflammatory action entirely removed, blistering on the region of the liver is generally beneficial, and should never be neglected; and in the more chronic and obstinate cases, the blister should be kept open, or an issue be made in the lower part of the side.

It is generally observed, that purgatives and laxatives operate more copiously after full depletions; and the action of blisters upon the region of the liver tends both to promote this effect, and to procure a freer secretion of more healthy bile. In no instance of inflammatory or other attacks of disease of the liver, should the physician neglect to inspect the motions passed by the patient: this should be done attentively at every visit; for it is chiefly by the condition of the stools that we are informed respecting the operation of the remedies, the secretions of the diseased organ, and the progress of the disease. The patient's account of them ought never to be depended upon. In all our hospital and private practice, we have made it a point to examine attentively every alvine evacuation. In crowded hospitals, this is attended with considerable inconvenience, unless proper measures are adopted respecting it. We have generally directed a commode to be placed at the bedside of each patient: 1st, in order that we might obtain due information on this point; 2d, that no tricks or impostures should be played; and 3d, that the

patient should neither be fatigued, or subjected to cold, by going to a common place of accommodation,—circumstances which cannot be too scrupulously attended to in practice in warm climates. The annoyance occasioned to other patients in the same ward was often considerable, but this was mitigated by ventilation, and by burning various kinds of fumigating pastiles. The chlorurets of lime and soda, recently introduced into practice, will completely remove this inconvenience, and prove of the most essential service in hospital practice and police. We were lately informed by Dr. Copland, that the best advantages were derived from these disinfectant agents in the public institutions to which he is physician, and where he had introduced them. Their almost instantaneous agency in removing all disagreeable odours and effluviæ, independently of their influence in counteracting the bad effects of miasmata and foul air upon the system, render them most valuable acquisitions to medical science.

Of other Means of Cure which frequently prove beneficial.—The remedies of which we have already treated generally prove of themselves sufficient for the removal of the greater number of the more active inflammations of the liver which occur in India or within the tropics. Whatever derangements remain to be combated after these remedies have been employed with sufficient decision and discrimination, partake most frequently of that character which the more chronic disorders of the liver assume; and the same treatment which the latter require is also beneficial in them. Even after the most acute symptoms of the disease have yielded, and the functions of the digestive organs have been restored to a certain extent, still it often occurs that considerable torpor of the diseased viscus continues, and a course of gentle laxatives and deobstruents, combined with tonics, is required, for the purpose of assisting the secreting power of the liver, of stimulating the sluggish bowels, and imparting tone to the frame generally. That an organ which has been the seat of acute disease, and which has most probably suffered in some degree in its organisation as well as in its functions, should have its actions impaired for some time after the more urgent disorder is relieved, may be reasonably expected. This state of function, whether it be the consequence of acute disease, or the concomitant of chronic derangement, ought to receive due attention from the practitioner. In whatever manner

it may be present, — whether as a consequence of former disease, or as a concomitant of existing disorder, — the ill consequences of neglect, and the advantages of resorting to suitable means of cure, should both be recollected. In order to fulfil the purposes of removal, the different relations of deficient energy of the liver ought to be considered, and the treatment directed accordingly. When an inactive state of secretion is present after acute or sub-acute inflammations of the viscus, the state of the organ, as regards the existence of pain, or of tumefaction or enlargement, ought to be carefully inquired into. If enlargement be detected, then small doses of the blue-pill, either alone or combined with Plummer's-pill, may be given at night, local depletions having been satisfactorily premised; and weak solutions of the neutral salts, or the infusions of senna and gentian, either alone or with salts, or the carbonates of the alkalies, may be taken early in the morning. If impaired and morbid secretion proceed from slow and insidious disease, and is connected either with congestion in the branches of the vena portæ, or with accumulations of inspissated or viscid bile in the hepatic ducts, or with a very chronic inflammatory action and a morbid state of the bowels, local depletions must not be overlooked; the mercurial remedies should be pushed farther, mercurial inunction on the region of the liver employed, and a full dose of calomel given at bed-time every third night, and followed in the morning by the common purging powder, or a cathartic or purging draught. If these means fail of producing a decided advantage, the greater part of the abdomen and both hypochondria should be sponged night and morning with the nitro-muriatic wash, in the manner which we shall have presently to explain; or the patient should use as a common beverage, of which he should drink frequently, the nitric acid in a state of weak solution. This is generally very grateful to the patient; and if the acid be given in sufficient quantity to produce a gentle excitation of the salivary secretion, much benefit will often be experienced from it. We have seldom, however, given it to this extent, as we have generally derived advantage from it in smaller doses. There are very few remedies which are more deserving notice than the nitro-muriatic acid wash, and the internal use of nitric acid, in cases of acute hepatitis, after active depletions and mercury have been used: they promote the return of strength and the healthy establishment

of the biliary secretion; and if deobstruent laxatives, with suitable regimen, be prescribed, and adhered to during their use, they remove obstructions, and promote a free circulation in the vessels of the liver. As a restorative of the energies of the system after mercurial courses, they have generally proved beneficial in our practice, particularly when conjoined with the cautious exhibition of gentle tonics, with light but nutritious diet, and suitable regimen.

Of the Treatment of the Complications of Acute Hepatitis.—Active inflammation of the liver often affects the stomach, sometimes symptomatically, at other times from the proximity of the part inflamed to this viscus, or from the extension of the inflammatory action to it. In either case, the removal of the disordered state of the stomach must depend upon the treatment adopted for the primary disease. There can be no means more efficient in fulfilling this intention, and in protecting the stomach from disorder, than the active depletory treatment which we have advocated; and where it is practised with decision and discrimination sufficiently early in the disease, we have seldom observed inflammatory action extend from the liver to this viscus. In those cases, however, which have been neglected at their commencement, or which have been treated too exclusively by means of mercury, with a view of inducing salivation, to the neglect of sufficient depletion, the supervention of gastritis to hepatitis is not an infrequent occurrence; the stomach being found inflamed upon examination after death, and glued to the concave surface of the liver, and sometimes also to the gall-bladder and ducts, by means of coagulable lymph effused from the inflamed surfaces. We have known cases wherein gastritis had supervened in its more dangerous form;—with cold extremities, remarkably quick and weak pulse, collapse of the features, great pain, anxiety, and tenderness at the pit of the stomach, and cold perspirations,—during the treatment of the hepatic disease; and where these symptoms were mistaken for those of abscess of the liver, and treated accordingly, the patient dying of the gastritis, without having undergone any depletion, and where little further was attempted than the exhibition of stimulants or tonics, or the induction of the specific effects of the mercury, which the existing febrile action, and the condition of disease and of system, prevented from supervening.

In the complication of gastritis with active inflammation of the liver, the treatment is nearly the same as that which we have already advocated. Depletions are obviously requisite, particularly copious local depletions, which should be repeated, and followed by the application of hot poultices, as long as tenderness is felt at the pit of the stomach. The large doses of calomel already recommended should be combined with opium, and the bowels excited to action by means of cathartic enemata. When the inflammatory action is subdued, then blisters, applied to the stomach and right hypochondrium, are generally beneficial, with the other details of treatment recommended in the section on the Treatment of Inflammation of the Stomach, to which we refer for information respecting those means applicable to the various forms which inflammatory disease of this viscus assumes. In every mode of complication between inflammations of the liver and stomach, the treatment which is best calculated to remove the one will generally relieve the other. The only precaution which should be attended to is not to irritate the inflamed stomach by the exhibition of stimulating or acrid purgatives: either the administration of purgatives by the mouth should be postponed (with the exception of the full doses of calomel and opium, which directly tend to subdue the disease in the stomach,) until the more acute symptoms are subdued, or those which are given should be the least likely to irritate this viscus, and be possessed of cooling properties; such as the supertartrate or tartrate of potash, or the soda tartarizata, dissolved in tamarind water. Purging enemata should be frequently thrown up, and the lower part of the body occasionally immersed in a warm bath.

With respect to the complication of active and chronic inflammations of the liver with dysentery, forming what has been well designated hepatic dysentery, we shall enter fully into its nature and treatment in our Second Volume, where dysentery, in its more prevailing forms, will receive from us due attention.

Inflammations of the liver, particularly in their active forms, are not infrequently complicated with disease of the right side of the thorax. This complication is often observed in the northern and north-western districts of India, particularly in those provinces which approach the northern tropic.

They are comparatively rare in the southerly districts, particularly those under the Madras Presidency. They are also frequently observed in the western hemisphere, especially in some of the West India islands. When acute inflammation attacks the convex surface of the liver, and, nearly simultaneously, the pleura and right lobe of the lungs, depletions, both general and local, are imperatively called for, and should be practised with boldness until the inflammatory signs entirely disappear, after which blisters should be applied; but in no case ought these latter to be prescribed until the inflammatory action has been entirely subdued.

In the complication of hepatitis with thoracic disease, it is often difficult to ascertain which is the primary disorder. On many occasions, disease supervenes in the form of pleuritis, or pneumonia, and seems to extend to the liver, owing to the predisposition of this organ to undergo inflammatory action, either from the pre-existence of functional derangement, or some other cause. In many instances, the inflammation extends from the superior surface of the liver to the diaphragmatic pleura, and thence to the costal pleura and lungs themselves. In those cases where much congestion accompanies the inflammatory action of the convex part of the right lobe, which, owing to the congested state, rises high into the right thoracic cavity, carrying the diaphragm before it, pneumonia is more or less completely simulated, according to the extent to which this part of the liver is enlarged, and the functions of the right lung impeded. The dyspnoea and cough which accompany this state of acute hepatitis often render it a matter of considerable difficulty to distinguish between it and pneumonia. When the lungs or pleura, or both, are simultaneously affected with the liver, there will, of course, be present the chief signs of both diseases; yet, on many occasions, this complication may be viewed as being either simple pneumonia, or an uncomplicated hepatitis. The extent to which the right lobe of the liver rises into the right thoracic cavity, in some cases, and thus simulates pneumonia,—even though the viscera in this cavity be perfectly sound, the lungs being only compressed by the enlarged liver,—may readily be inferred from the appearance of the right lobe in some of the Plates of disease of this organ, contained in the present Volume, and from the details of many of the cases. When the symptoms of

disease are referred chiefly to the chest, the state of the respiration and the character of the cough; the absence of the sputa marking disease of the lungs; the state of the digestive and alvine functions; the appearance of the faecal evacuations, and of the urine; the expression of the countenance; the colour and condition of the skin; the states of the tongue and mouth; and the general character of the pulse; will readily enable the observing practitioner to decide whether the liver or the lungs is the seat of disease; and, in complicated cases, what share of disorder is to be referred to each.

Disease, nevertheless, of the thoracic cavity is not infrequently met with upon examination after death, although it was scarcely detected during life, in several of the more chronic cases of hepatitis, more particularly those in which inflammation of an acute character had commenced in the convex part of the right lobe, and had been only partially subdued; so that some one of its consequences, such as abscess, with chronic inflammation of the adjoining parts, had supervened. Thus, we have observed adhesions between the lungs and costal pleura, or between the lungs and diaphragm, both recent and apparently of an old date; effusions of fluid into the thoracic cavity; and tubercles, or small vomicae, in the lungs, when the pulmonic symptoms present had been but little attended to, and been viewed merely as symptomatic of the hepatic disease. The necessity of discriminating in practice between the complications of actual disease and the mere presence of symptomatic disorder of function, is fully evinced by such occurrences; and where the practice is not to deplete largely in hepatic disease, such complications are very liable to supervene, and when they have supervened, are extremely prone to an unfavourable termination.

This result of observation, during different periods of our practice in hepatic diseases, has confirmed our opinion as to the propriety of decisive antiphlogistic measures in all cases of active inflammation of the liver, not merely as being calculated to remove it in its primary seat, but as being most essentially beneficial in preventing the extension of the disease to adjoining viscera, and of removing inflammation when it has thus made progress, and especially when it has occurred simultaneously in two or more organs or structures.

In the complication of hepatitis with pleuritis or pneumonia, active depletions are especially required, and all the details of the antiphlogistic regimen are necessary to their fullest extent. Copious purging should never be neglected; and during the periods intervening between the exhibition of aperients or purgatives, saline diaphoretics, with the spiritus ætheris nitricus, and the liquor antimonii tartarizati should be exhibited. Antimonial preparations ought never to be omitted, whenever we have reason to suppose that disease either already exists in the thorax, or is advancing from the liver to that cavity. They may be given, according to the particular circumstances of the case, along with other saline medicines, or with nitre and demulcents, with the liquor ammoniæ acetatis, or with the different preparations of mercury. When exhibited in this manner, they may be pushed so far as to occasion some degree of nausea. But if inflammatory action evidently exists in the liver, vomiting should not be produced; for although the action of vomiting may relieve the affection of the chest, it will generally aggravate the disease of the liver. We have frequently remarked, that, when an emetic had been exhibited in the more obscure cases of hepatitis, inflammatory action was rendered more acute and much more manifest by its operation, and that, although it was thereby aggravated, a beneficial effect proceeded from this circumstance, inasmuch as more decided measures were resorted to for its removal. When the disease presents the complication now under consideration, much benefit will often result, after depletions, purgatives, and antimonial diaphoretics have been carried sufficiently far, from the use of blisters, either on the opposite side, or on the right hypochondriac region; but until all inflammatory action has been reduced, little advantage can be expected from this means. We have even seen decided mischief arise from the too early employment of this mode of counter-irritation, owing to the cantharides heightening the inflammatory action already existing. We have, on this account, often preferred the insertion of an issue or seton, and we have recently resorted to the use of the tartar emetic ointment until a full eruption of pimples has been induced. In order that this effect may be procured as soon as possible, the ointment, consisting of two drachms of the tartar emetic to one ounce of prepared lard, should be rubbed upon a part in the vicinity of the seat of disease three times a day. In this complicated form of disease, the mercurial

remedies ought to be given, in combination with antimony, camphor, and opium; and if they do not produce a decided effect upon the disease, after they have been exhibited with activity for two or three days, they should be laid aside, and the nitric acid drink, with a few drops of opium, given for some time in their stead; the bowels being always well acted upon by purgatives, aperients, or enemata, according to the peculiarities of the case.

CASE CI.—*Acute Inflammation of the Liver.—Relapses.—Recovery.*

PATRICK M'KERNAN, admitted 20th May, 1817, 8 o'clock A.M., at Hyderabad. Complains of purging and pain in his belly.—Pulv. purg.

Evening.—Was well purged; he now complains of a sharp pain in the right side and thorax, which affects his breathing, and is very severe when he moves; pulse hard and sharp.—Apply thirty leeches to the side immediately. Calom. gr. xx. h. s. s. et haust. amar. cum sennâ. Mist. purg. ℥ij. primo mane.

21st.—Pain diminished; has been well purged; stools consist of a black, viscid matter.—Calom. gr. xx. h. s. s.

22d.—No stools in the night; feels pain in his chest, with dry cough; his tongue is cleaner.—Apply twenty-six leeches to his breast. Mist. purg. ℥ij. stat.

Evening.—Pain relieved by the leeches; stools watery; tongue clean.—Pilul. hydr. cum aloë. h. s. s. Haust. amar. cum sennâ, ℥ij.

23d.—Feels very well this morning; no pain; motions more natural.—Cont. pilul. et haust.

24th.—Stools natural; no pain; pulse good; tongue clean.—Discharged.

Re-admitted 26th, 7 o'clock A.M., having been drinking ever since he left the hospital.—Pulv. purg.

Evening.—Stools copious, watery, and very offensive; has severe pain in the side; pulse full and strong; tongue clean; skin of the natural temperature.—Apply thirty leeches to the part pained immediately.—Calom. gr. xx.; opii, gr. ij.; syrup. q. s. Fiant pilul.

27th.—Pain no better; stools natural in appearance, but of a darker colour than usual; tongue white and moist, covered with mucus, not excited; pulse small, not quick, nor does it indicate inflammation.—Mist. purg. ℥jv. stat. Apply a blister to the side.

Evening.—The blister has risen well; his stools are natural; his tongue is clean; pulse good, but he says the pain continues.—R Pilul. hydr. cum calom. no. 1. three times a day. Haust. amar. cum sennâ, ℥ij. nocte maneque.

28th.—Pain in his side less; tongue rather white; pulse regular.—Cont. pilul. et haust., and rub ʒj. unguent. mercur. over the side and belly twice a day.

Evening.—Says the pain is less; stools scanty.—Cont. ut antea.

29th.—Much better evidently.—Cont. med.

30th.—No pain at all.—Cont.

31st.—Mouth affected; in every respect better.—Mist. purg. ʒjv. statim. Discont. frictio. Cont. pilul. et haust.

June 1st.—Pain quite gone; belly regular.—Cont. pilul. ut antea.

2d.—Says he feels slight remains of the pain when he breathes.—Apply eighteen leeches to the part.—Cont. pilul. et haust. ut antea.

3d.—Says the pain is now quite gone, and he feels very well; bowels not sufficiently relieved by the pill and draught.—Mist. purg. ʒiij. stat.

Evening.—Has taken two doses of the mixture without producing any effect, and he feels very uncomfortable in consequence.—Enema purg. stat.

4th.—Pain returned again in the night, and still continues; motions copious and offensive; pulse full and sharp.—V. S. ʒxvj. Mist. purg. ʒjv. stat.

Evening.—Considerably better in every respect; has been well purged.—Haust. anodyn. h. s. s.

5th.—Still feels the pain, though it is not so severe; bowels not free; pulse soft and good; mouth sore.—Repet. mist. purg.

Evening.—Very well purged; stools of a clay colour, watery, and feculent.—Repet. pilul. et haust. amar. cum sennâ.

6th.—Feels much better this morning, but very weak; he still has the pain slightly; tongue clean; bowels regular; stools watery, with a mixture of dissolved fæces.—Apply a blister to his side. Cont. pilul. et haust. nocte maneque. R Decoct. cinchon. ℥j.; acid. vitriol. mxxx. M.; a wine-glassful three times a day.

7th.—Feels very weak; pulse not irritable or quick; pain is still felt under the fourth rib; mouth sore; tongue clean; gums swelled; the blister has done its duty.—Cont. bark. Cont. pilul. et haust. Give fowl soup for diet, and two glasses of punch.

8th.—Still feels a little pain in his breast; complains much of weakness; appetite good; pulse small and rather weak.—Discont. pilul. Cont. bark and punch. Fowl soup for diet.

9th.—Feels weak and faintish; bowels open; stools hardened fæces, small in quantity; pulse quick and irritable; still a slight pain.—Cont. ut antea. Ol. ricini, ʒij. statim.

Evening.—Stools copious, morbid, offensive, feculent, and tenacious matter; he looks and feels better.—Cont.

10th. — He exposed himself in some way to cold during the night, and was seized with pain and swelling in his belly, which are now diminished; pulse weak; tongue clean. — Foment the belly. Ol. ricini, ℥ij. stat. Cont. ut antea.

Evening. — Has been very well purged, and his stools are quite natural in appearance. — Haust. anodyn. h. s. s.

11th. — Pain much diminished; no stool. — Pilul. hydr. cum aloë. every night. Ol. ricini, ℥ij. stat. Cont. ut antea.

Evening. — Much better in every respect. Cont. pilul. aloë. Haust. anodyn. h. s.

12th. — Feels greatly better; motions more natural and feculent; pulse much improved. — Cont. pilul. et ol. ricini, ℥ss.

Evening. — The oil gave three motions, which were tenacious, morbid, and offensive. — Cont. ut antea.

13th. — Feels very well this morning, and the pain is almost gone. — Cont. pilul. aloë. et ol. ricini, ℥ss.

From this time he continued to recover, the above treatment being pursued till the 18th, when he was perfectly well, and discharged.

Remarks. — This case is a satisfactory illustration of the disease, and of the treatment advocated in the present section. It is extracted verbatim from the hospital diary, and from amongst several thousand cases of a nearly similar description, as regards both the causes, symptoms, treatment, and issue of the disease.

CASE CII. — *Acute Inflammation of the right Lobe. — Slight Relapse, from the too early use of Tonics.*

JOHN CALAGHAN, private, Madras European Regiment, æt. 32, a healthy man: admitted 22d February, 1813, at noon. Complains of a constant, acute pain under the false ribs of the right side, increased by the slightest pressure, or by coughing or sneezing; has no pain in his shoulder or back, but his loins are slightly affected; pulse 112, strong, and full; he is evidently now in a state of intoxication; tongue loaded; little thirst. — Apply twenty-five leeches to his side, and give ℥j. natron. vitriol. in lbj. of water immediately.

Evening. — The leeches bled freely, and he has been purged three or four times; the pain continues, but his pulse is below 100, soft, and regular; no thirst; the wounds from the leeches continue bleeding. — Mist. salin. febrif.

23d. — The pain in his side is no better, and it is increased by pressure; three fetid stools in the night, of a brown colour; pulse 84, rather full; no thirst; tongue clean; no appetite. — V. S. ℥xvj. Haust. purg. ℥xij. — Pulse after bleeding, 96, and rather fuller.

Evening.—The pain in his side not at all diminished, but there appears to be no other bad symptom; pulse 94; no thirst. The blood drawn does not exhibit the inflammatory appearance. —Apply a blister to the part affected: give the haust. purg. ex aquâ Cheltenhamii, ℥xij. statim; and give a purging enema.

24th. —The blister has done its duty, and relieved the pain in his side; he can now breathe with freedom; was purged several times by the draught; thirst rather urgent; pulse 84, and soft. —R Mist. salin.; a wine-glassful every two hours.

Evening.—His side is easier, but he still feels pain on pressure; no motion; pulse 80. —Pilul. hydr. gr. iij. h. s. s. Haust. purg. ℥xij. cras primo mane.

25th. —No alteration. —Cont. omnia.

26th. —Pain has left the side entirely, and he has no complaint but debility; tongue rather furred. —Cont. haust. purg. ex aquâ Cheltenhamii, ℥xij.

27th. —Gains strength, and is much better. —R Infus. gentian, ℥jss. Tinct. Calumb. 5j. M. ft. haust.; to be taken every day at twelve o'clock.

28th. —Says he has a very slight pain in his side; in all other respects he is very well; has not had a passage in his bowels for twenty-four hours. —Haust. purg. ℥xij.

Evening.—Has been freely purged; stools rather a light pale colour, partly formed, and partly fluid; pain in the side increased, but the pulse does not indicate inflammation, 80 in a minute; tongue clean; no thirst; skin cool. —Apply a blister. Cont. pilul. hydrarg. gr. v. h. s.

March 1st. —The blister has operated very well, and the pain is so great that he cannot discriminate between it and the pain in his side; pulse 80. —Omit the mid-day draught. Repet. mist. salin., and give a purging enema.

2d. —The pain in his side is much easier, and he can breathe with perfect freedom; pulse 100; no thirst; tongue clean. —Haust. purg. ex aquâ Cheltenhamii, ℥xij. stat.

Evening.—Has been purged very much, and was very severely griped; the pain in his side is quite removed; pulse 96; belly rather tense. —Foment the belly.

3d. —Fomentation removed the griping; he is quite free from pain, and is now convalescent. —Continue the saline mixture, and occasionally the purging draught.

These were continued till the 9th, when he was perfectly recovered, and returned to duty.

Remarks.—This case presents a specimen of the usual mode of practice in many, and shews the importance of active depletion and purgation in the disease. The too early employment of tonics was here prejudicial. The use of mercury, with the view of inducing its specific effects, was deemed unnecessary, and its omission did not impede the complete recovery of the patient.

CASE CIII. — *Acute Hepatitis; disordered Secretion of Bile; repeated Depletions; Mouth not affected with the Mercury.— Recovery.*

PHILIP SHERIDAN, of a fat, soft, leuco-phlegmatic habit, admitted in the evening of the 31st December, 1816, with severe pain in his side. — Twenty leeches were applied, by order of Mr. De Lisle.

January 1st, 1817. — The leeches bled very well, but the pain is not at all diminished, and is situated in the superior, posterior part of the liver; pulse soft, 80; tongue clean; no feverish heat. — Apply twenty leeches to the part pained. Mist. purg. \bar{z} jv. Magnes. vitriol. \bar{z} ss. stat. capiend. Enema purg. No stools were procured; the purging mixture was repeated; and at half-past two o'clock P. M. a blister was applied to his side.

Evening. — Pulse 120, small and oppressed; can breathe with more ease, but the pain in his side continues; stools natural and feculent, very offensive. — Apply twenty leeches more. Calom. gr. xx.; pulv. antim. gr. vj.; syrup. q. s. Ft. pilul. h. s. s. Mist. salin. febrif. ut antea.

2d. — Pain removed; tongue dry and white; stools green and curdled; pulse regular, 84; had no sleep; skin cool. — Mist. purg. \bar{z} jv. cum natron. vitriol. \bar{z} ss. Calom. gr. xij. h. s. s.

3d. — Stools scanty and bilious; complains of pain in his loins immediately under the blister; no fulness or pain in the seat of the liver, but, upon strong pressure, he feels a considerable pain in the posterior part of the liver and kidneys; his tongue is clean; he has no cough; breathes with ease; skin warm, but not hot or feverish; he has no sickness; considerable thirst; no appetite; pulse 120. — Apply twenty leeches to his side. Pulv. purg. stat. Enema purg. R Mist. salin. febrif. \bar{l} bj.; vin. antim. \bar{z} ss.; spirit. æther. nitros. \bar{z} ss. M. ft. mist.; a wine-glassful every hour. Calom. gr. xx.; pulv. antim. gr. vj.; syrup. q. s. Ft. pilul.

4th. — Pulse not so irritable, but still quick, 100; stools small, and of a light yellow-green colour; tongue rather white; pain in his side he thinks much better; feels slight pain when he takes a full inspiration. He received an injury by falling into the hold on board ship, and has never been well since. He was in hospital at Madras a considerable time for this same complaint. — Apply twenty leeches. Pulv. purg. \bar{z} j. stat. Enema purg. Cont. mist. salin. ut antea. Rub in \bar{z} j. unguent. mercur. nocte maneque, on the thigh. Calomel. gr. xx.; pulv. antim. gr. vj., syrup. q. s. Ft. pilul. h. s. s.

5th. — The pain in his side is less, and he can breathe with perfect ease; his stools are scanty and morbid; tongue clean, but rather dry in the centre; pulse rather irritable, 88; skin cool. — Pulv. purg. Enema purg. Cont. frictio, et cont. mist. salin.

Evening. — Stools changed, of a natural colour, and he feels a burning sensation in passing them; pain in his side is less; tongue excited; pulse soft and full, and seems to intermit on pressing the artery; has no pain or soreness in his belly on pressure; can breathe very freely. — Calom. gr. xx. h. s. Cont. mist. salin. Enema purg.

6th. — Stools not copious, but green, viscid mucus, with some glairy mucus and blood; feels much better; tongue clean, but rather dry; pulse regular, 70; pain in his side much better; can breathe very well and freely. — Mist. purg. $\bar{\text{z}}$ jv. cum natron. vitriol. $\bar{\text{z}}$ ss. Enema, ut antea. Frictio, &c. Calom. gr. xij. h. s. Pulv. Doveri, gr. xv. h. s.

7th. — Stools bilious, watery matter, with white, formed fæces, and some mucus, very offensive; tongue clean; perspired freely; pain in his side quite removed; pulse 90; skin warm; mouth not sore. — Repet. mist. purg. cum magnes. vitriol. $\bar{\text{z}}$ ss. Repet. enema. Repet. frictio. Pilul. aloë. cum calom. three times a day. Pulv. Doveri, gr. xv. h. s. s.

8th. — The pain in his side better, but his pulse is still frequent and flurried; his tongue is clean and moist; stools natural; mouth not at all sore; he breathes quite well, and has no pain. — Repet. mist. purg. $\bar{\text{z}}$ jv. ut antea. Cont. pilul. ut antea. Cont. frictio. Cont. pulv. Doveri, gr. xv. h. s. s.

9th. — Stools feculent, with green mucus; tongue clean; pain quite gone; pulse natural, 68; perspired a good deal in the night. — Repet. mist. purg. $\bar{\text{z}}$ jv.; natron. vitriol. $\bar{\text{z}}$ ss. M. cap. stat. Cont. ut antea. Repet. pulv. Doveri, &c. &c.

10th. — Stools natural; pain quite gone; tongue clean; pulse natural; mouth not sore. — Omit. mercur. Mist. purg. $\bar{\text{z}}$ jv.; magnes. vitriol. $\bar{\text{z}}$ ss. Repet. pulv. Doveri.

11th. — Stools perfectly natural this morning, and his tongue is clean and healthy; he has no pain at all; pulse only 60 in a minute, rather irregular, but appears more from nervous affection than irritation; he was seized yesterday evening with a fainting sensation after taking some milk; he broke out in a full perspiration, and on attempting to rise, fell down, and was seized with excessive palpitation and oppression; he has nothing of the kind now, but feels weak. — Mist. salin. febrif. $\bar{\text{h}}$ j.; aquæ ammon. $\bar{\text{z}}$ j. M.; a wine-glassful every two or three hours.

12th.—Tongue clean; no pain at all; pulse quite natural; skin cool. — Mist. amar. cum sennâ, ℥ij. cum magnes. vitriol. ℥iij.

Evening.—No pain at all; stools natural; tongue clean; pulse good. — Cont. mist. amar. — 13th. Quite well. Discharged.

Remarks.—The advantages of decided local depletions and purgatives are well shewn in this severe and obstinate case. Dover's powder is most beneficial in cases of this description, when given at bed-time, and followed by a purgative in the morning. The palpitation and oppression experienced on the 31st February proceeded entirely from exhaustion, which was speedily removed, and recovery hastened, by the remedies then ordered. The mercurial part of the treatment was omitted, when it was found that the mouth could not be affected, after it had been carried as far as the circumstances of the case could admit of with safety.

CASE CIV.—*Acute Hepatitis; Depletion not sufficiently copious during the first days of the Treatment, although about ninety ounces were taken by Leeches; Mouth not affected by the Mercury.—Recovery.*

CHRISTOPHER MURRAY, ætat. 26, admitted 18th September, 1816, in the evening, on the march to Kurnool. Complains of pain in his belly, and sickness at stomach; tongue foul; pulse quick; skin hot; very thirsty. — Apply eighteen leeches over his belly. Calom. gr. xx. h. s.

19th.—No material change. — Mist. purg. ℥ij. Apply ten leeches to his belly, and eight to his temples. Calom. gr. xx. h. s.

20th.—Was seized in the night with a very sharp pain in the right hypochondrium, about the seat of the liver; the pain in his belly and head is diminished; pulse frequent and full; tongue clean; belly open. — Apply fourteen leeches to the part pained. Mist. purg. ℥ij. Calom. gr. xx. h. s.

21st.—Says he is better this morning, but has still pain in the side. — Apply fourteen leeches. Mist. purg. ℥ij. stat. Calom. gr. xx. Sago.

22d.—Less pain; pulse better; great soreness in his belly; in other respects better. — Mist. purg. stat. Apply a blister over the belly. Calom. gr. xx. h. s.

23d.—Passed a good night; he is better, but the pain continues a little; pulse 96. Mist. purg. ℥ij. stat. Mist. salin. febrif. ℔j. Calom. gr. xx. h. s.

24th.—Had a great deal of pain in his side last night, particularly when he lay on the left side; his pulse is full and frequent, 102; tongue dry; bowels well purged;

skin warm and moist; has no pain on pressure; feels his mouth very slightly affected; has taken two drachms of calomel in six days; has no cold shivering or sweats. — Apply twenty leeches to the part pained. Mist. purg. ℥ij. Haust. anodyn. h. s. cum tinct. opii, ℥l. Calom. gr. xx.

25th. — Much better this morning; passed a good night; still feels pain in his side, but by no means so violent; pulse 96, regular; tongue cleaner. — Mist. purg. ℥ij. stat. Mist. salin. febrif. Enema purg. Repet. calom. gr. xx. et haust. anodyn. h. s.

26th. — Less pain this morning, and feels generally better; his tongue is cleaner, and his pulse is soft and good; skin cool; mouth not at all affected. — Mist. purg. ℥ij. Rub in ℥j. unguent. mercur. nocte maneque. R Calom. gr. ij.; opii, gr. j. every night.

This treatment was continued till the 2d October, the pain disappeared, and he was then considered convalescent; but we were not able to affect his mouth, although he has rubbed in and taken mercurial pills since the 12th of last month. — Cont. frict. et mercur. pilul. Mist. purg. ℥ij. m.

October 3d. *Evening*. — Pain has returned with severity; pulse small, not quick. — Apply fourteen leeches. Pilul. calom. gr. xij. h. s. s.

4th. — Very much relieved by the leeches; pulse better; great thirst. — Mist. purg. P.M. Tea, &c. Blister his side. Calom. gr. xij. h. s.

5th. — Much better, less pain, and can move about. — Mist. purg. ℥ij. P.M. Calom. gr. xij. h. s. Cont. mist. et frictio. ut antea.

6th. *Evening*. — Feels his mouth tender; can lay on the left side with more ease. — Cont. frictio. Calom. gr. xij. h. s.

7th. — Has less pain; gums rather swelled; some thirst; bowels the same; pulse 72, full and distinct. — Pulv. purg. Cont.

Evening. — Has been a good deal purged. — R Infus. amar. ℥jss.; aquæ ammon. ℥xx.; tinct. cardam. com. ℥ss. M. ft. haust.

8th. — Free from pain; bowels regular, but he feels weak. — Decoct. cort. lbj.; acid. vitriol. ℥xxx. M.; a wine-glassful five or six times a day. Recovered from this day, and was discharged on the 14th.

Remarks. — The treatment in this case admits of but few remarks. The local depletions were not sufficiently decisive during the commencement of his illness. The difficulty of affecting the system by the mercury was very great, and probably arose from the general vascular excitement not having been sufficiently subdued in the early period of the disease. This patient was treated during a fatiguing and difficult march, — a circumstance tending much to influence the treatment and aggravate the disease.

CASE CV. — *Active Inflammation of the Substance of the Liver, with Morbid Secretion of Bile, Accumulations in the Bowels, &c. — Recovery.*

HENRY PARKER, ætat. 20, admitted into hospital on the 30th of May, about eight o'clock, P.M., with pain in his belly and griping. — Calom. gr. xij. h. s.

31st. — Motions offensive and copious, but of a natural colour; tongue foul; pain in the right side, in the seat of the liver; there is no enlargement; pulse frequent, hard, and vibrating. — Apply thirty-six leeches immediately to the side. Mist. purg. ℥jv.

Evening. — The pain is much diminished by the leeches, they bled very freely, and he fainted; pulse still quick and hurried, but not vibrating; tongue excited and foul; skin moist; stools feculent, and mixed with viscid, tenacious mucus. — Calom. gr. xx.; opii, gr. ij. h. s. s. Mist. salin. febrif.; a wine-glassful every two hours.

June 1st. — Pulse sharp and frequent, but not full, 105; tongue excited; stools variegated, consisting of green and black, tenacious, fetid matter; feels a general soreness over his belly, and a pain fixed between the false ribs and umbilicus; no fulness on examination, but the pain is severe. — Apply twenty leeches to the part immediately. Enema purg. Mist. purg. Cont. mist. salin. febrif.

Evening. — The leeches bled well; he is very weak; skin cold; pulse hurried; stools feculent, with some blood; says the pain is quite gone. — R Tinct. opii, ℥lx.; aquæ ammon. ℥xx.; spirit. lavend. comp. ℥j.; aquæ puræ, ℥ij. M. ft. haust. A little mulled wine, and sago and wine for supper.

2d. — Passed an indifferent night; has a cold, clammy dew upon his skin; pulse quick, 114 in a minute; had two good motions in the night; the pain in his side is quite gone; tongue foul and excited. — No medicine. Tea for breakfast, and chicken broth at twelve o'clock, with sago and milk occasionally.

3d. — Much better; pulse frequent, 100; motions feculent. — Pilul. hydrarg. cum calom. no. 1. three times a day. Haust. amar. cum sennâ, ℥ij. nocte maneque.

4th and 5th. — No material change. — Cont. ut antea.

Evening. — Has passed a great quantity of green, viscid matter, like sea-weed, and feels better, but there is a soreness over the belly; pulse 100, soft, and stronger than it was. — Apply a blister over the belly. Calom. gr. xx. h. s. s.

6th. — Stools copious, feculent, and of a pale, whitish colour; pulse full, soft and strong, 102; tongue clean; pain in the belly much less; the blister has risen well. — Mist. purg. ℥jv.

Evening. — Stools more copious, of the same kind as last report; pulse the same. — Calom. gr. xx. h. s. s. Mist. salin. febrif.

7th. — Stools morbid, feculent matter, with mucus; pain much less, and he is better in every respect. — Mist. purg. ℥jv.

Evening. — The blister is very painful and troublesome, which is indeed all he complains of; he has slight fever in consequence; tongue excited; pulse full and strong. — Cont. mist. salin. febrif.

8th. — Pulse 102, full and strong; motions morbid and feculent; pain quite gone; tongue foul, white, and excited. — Haust. amar. cum sennâ, ℥ij. nocte maneque. Cont. mist. salin. febrif.

Evening. — Mouth rather tender. — Pilul. hydr. cum ipecac. no. l. ter die. Cont. haust. — 9th. Cont.

10th. — Stools amazingly copious, viscid, tenacious, and yellow mucus, like leather; pulse still quick. — Cont.

11th. — Mouth slightly affected; motions more natural; no uneasiness of any kind. — Cont.

12th. — Pulse, for the first time, 94; improving daily. — Cont.

These medicines were continued without intermission till the 18th, when he was perfectly recovered, and discharged.

Remarks. — Depletion was carried to its greatest length in this case, and with the other parts of the treatment, proved most serviceable. The state of the biliary and intestinal secretions required the full operation of mercury. But upon the mouth becoming affected, the motions improved, and the blue-pill with ipecacuanha, with the bitter purging mixture occasionally, was the only medicine required until his discharge.

CASE CVI. — *Active Inflammation of the Substance of the Liver; Morbid Accumulations in the Bowels; Decisive Depletions. — Recovery.*

JOHN ROACH, ætat. 26, admitted 14th May, 1817. Complains of pain in his side, and constipated bowels. — Mist. purg. ℥jv. statim.

Evening. — Has been very little purged; pain continues severe; tongue clean; pulse quick and hard. — Apply twenty-six leeches to the side immediately. Calom. gr. xx. stat. Haust. amar. cum sennâ, ℥ij. h. s. s.

15th. — Pain much less; tongue foul; pulse quick and flurried. — Mist. purg. ℥jv. statim.

Evening. — Purged very fully; motions morbid, dark-coloured, and very fetid; tongue foul; pulse full and irritable. — Repet. calom. gr. xx., et haust. amar. cum sennâ, h. s. s.

16th. — The pain is much better ; he has a bitter taste in his mouth, and an inclination to vomit. — Mist. emet. stat.

Evening. — The vomit brought away nothing but pure water ; the pain in his side is removed, but he feels general pain over his whole body and limbs. — Pulv. Doveri, ʒj. h. s. s.

17th. — No change for the better. — Mist. purg. ʒjv. stat., et pulv. Doveri, h. s. s.

18th. — Pain increases, and is general ; skin hot ; pulse full and quick. — Mist. purg. ʒjv. V. S. ʒxxjv. Pulv. Doveri, h. s. s.

19th. — The blood is cupped, and has the buff coat ; thinks he was relieved by bleeding, but not fully ; pulse still full and hard. — V. S. ʒxxx. Mist. purg. ʒij.

Evening. — The blood still cupped, with a deep-buff coat ; feels much better. — Repet. pulv. Doveri, ʒj.

20th. — Much better this morning in every respect. — Mist. purg. ut antea. Pulv. Doveri, h. s. s.

21st. — General pains returned ; pulse strong and full. — V. S. ʒxxx. This blood had a deep coat of buff, but it was not cupped ; he is infinitely better in every way ; bowels have been well relieved, and the motions are morbid and copious. — Pulv. Doveri, ʒj. h. s. s.

22d. — Perfectly free from all complaints. — Ol. ricini, ʒij.

Evening. — The oil has had an excellent effect ; motions not at all morbid. — Pulv. Doveri, ʒj. h. s. s.

23d. — Has no complaint, but he feels weak. — R Decoct. cinchon. ℥j. ; acid. vitriol. mxxx. A wine-glassful every four hours.

Tonics were continued, with occasional laxatives, and he was discharged, quite well, on the 3d of June.

Remarks. — The constipation in this case led to the employment of purgatives and leeches merely, with the expectation that the symptoms would yield to a free evacuation of the bowels. The sickness and bad taste of the mouth seemed to indicate the propriety of an emetic, which, however, was of no farther service than to develop the disease. The increase of pain, general uneasiness, and pains in his body and limbs, and the other symptoms present, evinced the great extent of disease, particularly of the substance of the liver, existing in this case. Very decided depletions were evidently required, and the success following their employment was striking. The circumstances chiefly deserving notice are the extent of depletion employed, the morbid accumulations in the bowels, and the benefit resulting from their removal.

CASE CVII.—*Active Inflammation of the Substance of the Liver ; Depletions, Purgatives, &c.*

JAMES EUSTACE, ætat. 26, admitted this evening, 30th May, 1817; has had fever all day, and has been drinking the pernicious drinks of the country; tongue excited and foul; an emetic immediately.

31st. — Feels better this morning; was vomited and well purged during the night; pulse full and strong, 86 in a minute; tongue clean. — Mist. purg. $\bar{3}$ jv. stat.

Evening. — Stools natural; tongue clean; pulse full, quick, and strong; feels a trembling sensation over him, and complains of pain on pressure upon the liver, and there appears to be some fulness. — Apply twenty-six leeches to the region of the liver. Calom. gr. xij. h. s. s.

June 1st. — The pain in his side is worse this morning; the leeches bled very well; pulse hard and quick, 112; breathing affected. — V. S. $\bar{3}$ xxjv. Mist. purg. $\bar{3}$ jv.

Evening. — Has passed a great deal of green, viscid bile; the pain is much less; pulse the same; the blood is not cupped, nor has it the buff coat, but the serum has a peculiar yellow colour. — Calom. gr. xij. h. s. s.

2d. — Free from pain; tongue clean; no stool; pulse natural. — Mist. purg. $\bar{3}$ jv.

Evening. — Much better; stools copious, crude, and morbid. — No medicine.

3d. — No complaint. — Mist. purg.

4th. — Quite well; motions natural; pulse good. — 5th. Discharged.

Remarks. — The local depletion merely removed the congestion and load oppressing the vascular system, and gave free action to the vessels; hence the increased action on the 1st, which required general depletion for its removal. When the internal structure of the liver is the seat of inflammation, the blood drawn seldom presents the cupped and buffed characters,

CASE CVIII.—*Active Hepatitis, with Accumulations in the Colon, &c.*

JAMES COLLINS, ætat. 22, admitted 14th May, 1817, in the morning, with violent pain in his side. — Twenty-six leeches were applied immediately, and $\bar{3}$ jv. purg. mist. given.

Evening. — Feels no better; pulse not very quick; tongue white, but moist; no fever; stools bilious. — Apply twenty-six more leeches to the side. Calom. gr. xx. h. s. s.; et haust. amar. cum sennâ, $\bar{3}$ ij.

15th. — Pain in his side much easier; tongue rather excited; pulse oppressed. — Mist. purg. $\bar{\text{z}}$ jv. stat.

Evening. — Pain in his side returned; pulse small and sharp; tongue clean; has been well purged. — Apply twenty-six leeches to the side. — Repet. calom. gr. xx., et haust. amar. $\bar{\text{z}}$ ij.

16th. — Side much easier, but he has still pain; tongue clean; pulse oppressed and slow. — Apply twenty-four leeches to the side. Mist. purg. $\bar{\text{z}}$ jv. stat. Enema purg. Pilul. hydr. cum calom. no. 1. ter die.

Evening. — Pain less; tongue cleaner and more natural; pulse the same. — Calom. gr. xx. h. s. s.

17th. — The pain in his side nearly gone; pulse the same; tongue white. — Mist. purg. $\bar{\text{z}}$ jv.

Evening. — Has no pain; his bowels have been fully relieved, and he says he feels quite well. — Haust. amar. cum sennâ, $\bar{\text{z}}$ ij. nocte maneque.

18th. — No pain at all; motions very good and copious. — Mist. purg. $\bar{\text{z}}$ jv.; et repet. haust. ut antea.

19th. — Says the uneasy sensation in his side has returned, but he has no pain; pulse full and frequent; tongue foul. — R Pilul. hydr. cum calom. four times a day. Pulv. purg.

Evening. — Motions copious, viscid, dark-coloured mucus. — Cont.

20th. — No material change. — Cont. Rub in $\bar{\text{z}}$ j. unguent. mercur. on the side, morning and evening.

Evening. — Has a sharp pain in his side this evening when he takes a deep inspiration. — Apply eighteen leeches. Cont. pilul., haust., et frictio.

21st. — Cont. — 22d. Motions perfectly natural. — Cont.

23d. — Motions this morning crude, with hardened fæces. — Mist. purg. $\bar{\text{z}}$ jv. Cont. ut antea.

24th. — Slight ptyalism; no pain; stools natural. — Cont. ut antea. Mist. purg.

Evening. — Quite easy; motions full of lumps of hardened matter, which appears to have been lodged in the bowels for some time. — Cont.

25th. — Better. — Cont. — 26th. Discont. pilul. et frictio; considerable ptyalism. — Repet. haust. amar. cum sennâ.

26th, 27th, 28th, 29th. — Cont. — 30th. Pulv. purg. stat.

Evening. — Has passed a great quantity of hardened fæces, and very offensive. He required no other medicine but laxatives from this time, and returned to his duty, perfectly recovered, on the 4th of June.

Remarks.—The oppressed and slow state of the pulse during the early stages of disease seemed to proceed from the feculent and morbid accumulations in the bowels. We have seen numerous cases wherein a similar effect upon the pulse was evidently produced by the collection of morbid secretions and fæces in the large intestines.

CASE CIX. — *Acute Hepatitis supervening to Dysentery, with Congestion, Enlargement, &c. — Recovery.*

JOHN DOYLE, ætat. 24, Artillery, 12th November, 1820. Admitted this morning, with acute pain in the right hypochondrium, which is considerably increased on a pressure being made, or when he takes a full inspiration; pulse full, and rather sharp; skin cool; tongue clean; says he had purging during the last two months, and passed a great deal of blood; the pain in his side attacked him four days ago; thirst urgent; appetite impaired; complains also of vertigo and headach. — Capiat pulv. jalap. compos. ʒj. statim. App. hirudines xvj. hepatis regioni, necnon xij. temporis. R Haust. salin. comp. ʒjss. tertiâ quâque horâ. Spoon diet.

Vespere.—Three stools of a dark colour and copious, from his medicine; head easier, as also his side, but the pain is still very acute when he takes a full breath; skin natural; tongue clean; pulse soft and calm; thirst less urgent. — R Hydr. submur. ʒj.; opii puri, gr. ij.; pulv. antim. gr. iij.; cons. rosæ, q. s. Ft. pilul. h. s. s. Cont. haust. salin. ut antea. Fetus pro hepatis regione.

13th.—Alvine evacuations rather scanty, and of a green colour; side easy; pain in his head relieved; tongue furred and foul; thirst urgent; pulse 86, soft, firm; short dry cough. — Repet. pulv. aper. stat. Cont. mist. salin.

14th.—Purged copiously by his medicine; stools of the same appearance; side pretty easy, but still painful on a pressure being made, and there is a slight degree of fulness under the margin of his ribs; tongue foul; pulse 90, rather sharp; skin perfectly natural; head easy; thirst urgent; appetite impaired. — Capiat pulv. jalap. compos. ʒj. stat. Repet. hirudines xij. parti dolenti. Cont. haust. salin. compos. ut antea. R Pilul. aloët. cum calomel. no. 1, ter die.

15th.—Pain in the hepatic region relieved; pulse 80 and regular; skin natural; tongue clean; stools feculent and offensive. — Cont. med. R Mist. amar. cum sennâ, ʒiij. cum sodæ sulph. ʒij. omne mane.

16th.—Passed a good night; side easy; stools bilious, copious; tongue rather

foul; no fever; pulse 78, full, with a degree of sharpness; he can take a full inspiration with ease, but he feels a slight pain in the hepatic region when he coughs, or when he moves from one side to the other. — Repet. hirudines xij. parti dolenti. Cont. med.

17th. — Stools dark green, feculent, and copious; side easy: tongue clean; pulse and skin natural; gums swollen and tender. — Cont. med.

18th. — Stools as at last report, and fetid; mouth very sore; side easy; pulse rather quick, firm, soft; skin natural. — R Pulv. jalap. compos. ʒij. stat. Cont. pilul. bis die. Cont. alia.

19th. — Purged copiously; stools highly bilious; mouth very sore, with copious ptyalism; side quite easy. — Repet. pulv. aper. stat. Omit. alia. R Alum. ʒj.; aq. puræ, lbjss. M. ft. garg. sæpè utend.

20th. — Says he feels no complaints, with the exception of a sore mouth; stools copious, feculent, and of a natural colour; ptyalism free. — Cont. garg.

21st. — As yesterday. — Cont. med. — 22d. Convalescent. — Cont.

23d. — No complaints, with the exception of a sore mouth; appetite good. — Cont. garg. Low diet.

24th. — As yesterday; ptyalism copious. — Cont. garg.

25th. — Convalescent. — Pulv. jalap. ʒij. stat.

26th. — Better. — Mist. amar. cum sennâ. These were continued till the 30th, when he was perfectly well and discharged.

Remarks. — The previous existence of dysenteric disease, which probably originated in diseased liver, and the enlargement of this organ, rendered active depletions, followed by a short mercurial course, indispensable. The case satisfactorily illustrates the advantages of the treatment adopted. In many cases, such as some of those which follow, where inflammation supervenes in a healthy liver, the specific effects of mercury are by no means requisite.

CASE CX. — *Acute Hepatitis; copious Depletion, &c.*

THOMAS JONES, ætat. 26 years, admitted 11th June, 1817. Has been drinking very hard, and complains of headach and fever; tongue foul. — Mist. emetic.

12th. — He vomited green bile; was not purged; tongue white and excited; has headach; pulse hard and not quick; has a griping pain in his belly, and pain in his shoulder. — Apply twenty-four leeches to his temples. Mist. purgan. ʒiij. Cal. gr. xij. h. s.

13th. — Tongue excited and white; pain in his belly, right side, and shoulder;

head easier; pulse full, soft, and distinct. — Apply twenty-six leeches to his side. Mist. purgan. ℥jv.

Evening. — Tongue cleaner; pain is less; stools copious; pulse frequent. — Apply a blister to his side. Cal. gr. xx. h. s.

14th. — The pain in his side is no better, and it catches him when he breathes. — V. S. ad ℥xxvj. Rub in ℥j. ungt. mer. three times a day. Mist. purg. ℥jv.

Evening. — Pain in his side is easier; stools green and bilious; tongue white and excited; pulse better. — Cal. gr. xx.; opii, gr. ij. h. s.

15th. — Pain in his side diminished. — Mist. purg. ℥jv. Rub in ℥j. ungt. mer. three or four times a day.

Evening. — Pain in his side less, but the pain in his shoulder continues, and headach is very troublesome. — Pilul. aloë. cum cal. no. 1, three times a day. Rub in four times a day. Mist. amar. cum sennâ, ℥ij. h. s.

16th. — Has no pain in his side, but has pain in his shoulder and head; pulse full and soft; tongue rather excited. — Shave his head, and apply twenty leeches to the part where he feels pain. Cont. pilul. et frictio. ut antea. Mist. purg. ℥jv. Pulv. Doveri, ℥j. h. s.

17th. — Tongue more healthy and cleaner; head better; did not sweat in the night. — Pulv. purg. Cont. pilul. et frictio.

Evening. — Much better. — Cont. pilul. et frictio.

18th and 19th. — Cont. ut antea. Cal. gr. xij. h. s.

20th. — Stools green and bilious. — Mist. purg. ℥jv.

21st. — Much better. — Pulv. purg. — 22d. Meat diet.

23d. — Discharged.

Remarks. — The depletion and purging in this case completely removed the disease in a short time. Although mercurials were employed with great energy, yet their specific action did not supervene: the recovery, however, did not seem to be delayed, or the less complete on that account.

The following cases of the simpler forms of active inflammation of the liver require no comments. They are taken, without any selection, from many hundreds of a similar description, as respects both the symptoms and treatment, contained in the hospital diaries, and are given verbatim as they appear there.

CASE CXI.—*Acute Hepatitis, from Congestion and Accumulation of Bile.*

PETER MALLONE, ætat. 18. August 23, 1819. Admitted this evening with acute pain in the right hypochondriac region, particularly on a full inspiration or pressure; pulse full and quick; skin rather hot, but moist; bowels constipated; tongue white and excited.—V. S. ad ζ xxxij. The first sixteen ounces covered with buff and cupped; the second not at all so. Sumat hydr. submur. gr. xx. stat., necnon habeat enema purg. R Pulv. jalap. comp. ζ j. primo mane.

24th.—Side much better; had six stools, copious, feculent, dark coloured, and very fetid; pulse regular; skin rather hot, but moist; tongue very foul and excited; powder just taken; no pain on pressure or inspiration this morning in the region of the liver.—*Vespere*. Bowels freely opened; no pain of the side.—Repet. hydr. submur. gr. x. h. s.; et pulv. jalap. comp. mane.

25th.—Pain in his side quite removed; pulse 66 in a minute; skin natural; tongue rather foul; has taken the purgative.

26th.—Pulse and skin natural; feels quite well.—Repet. mist. purg. stat.

27th.—Feels very well; has no pain, but his face is flushed, and his pulse is quick.—Pilul. hydr. nocte maneque. Mist. amar. cum sennâ nocte maneque.

28th.—Quite well.—Cont.—29th. Cont.

30th.—Quite well. Discharged.

CASE CXII.—*Acute Inflammation of the Liver, speedily yielding to Local Depletion and Purging.*

JAMES HELPIN, recruit, just arrived from England. Admitted this evening (17th August, 1819) into General Hospital, Madras; a healthy young man, 19 years of age. Complains of very acute pain in the right side and shoulder; cannot bear the least pressure in the region of the liver; bowels loose; skin cool; tongue clean; pulse quick and irritable; was taken ill this morning.—Cal. gr. x. h. s. s. Apply sixteen leeches to the side immediately.

18th.—Pain relieved, but not removed.—Mist. purg. stat.

Vespere.—Has been well purged; the pain has returned in his side with great severity.—Apply sixteen more leeches. Cal. gr. x. h. s.

19th.—Quite well this morning; tongue clean.—Mist. purg.

20th.—No complaint.—Haust. amar. cum sennâ, ζ ij. nocte maneque. This was continued till the 23d, when he was discharged perfectly recovered.

CASE CXIII. — *Acute Hepatitis, removed by Leeching, Mercurials, and Purgatives.*

EDWARD BRADFORD, ætat. 21, admitted 22d May, 1817, in the evening, with pain in his side and chest, foul tongue, and considerable fever.—Apply twenty-six leeches. Calom. gr. xx. h. s. s.

23d.—Pain rather better, but not gone; tongue excited: pulse small; skin moist.—Mist. purg. ℥jv. statim. Apply twenty-six leeches.

Evening.—Pain removed from the side, and is now very severe at the scrobiculus cordis, and affects his breathing; stools copious, feculent; pulse good; tongue clean.—Calom. gr. xx. h. s. s. Apply twenty-six leeches to the scrobiculus cordis. Mist. salin. febrif.

24th.—Pain much less; tongue clean.—Mist. purg. ℥jv.

Evening.—Stools green and feculent, but not copious; feels fulness in his belly.—Enema purg. Calom. gr. xx. h. s.

25th.—Feels much better this morning; pain all gone; mouth sore; stools crude and feculent.—Mist. purg. ℥jv.

Evening.—Well purged; stools natural; feels better; no pain.—Haust. amar. cum sennâ, ℥ij. nocte maneque.

26th.—No pain at all; stools watery, with some green fæces.—Repet. mist. purg.

Evening.—Stools watery, and of a very dark colour.—Haust. amar.

27th.—No complaint.—Cont. haust. amar. cum sennâ nocte maneque.

This was continued till the 31st, when he was perfectly recovered, and discharged.

CASE CXIV. — *Acute Inflammation of the superior surface of the Liver, &c.*

JAMES MATON, ætat. 28, admitted 3d May, 1817, at Hyderabad. Attacked this evening with violent pain in his right side and chest; great difficulty of breathing; severe, dry cough; tongue white and dry; pulse quick and strong.—Apply twenty-four leeches immediately to the hypochondriac region. Calom. gr. xx. stat.

4th.—Pain removed; tongue clean; pulse good.—Pulv. purg.

Evening.—Fully purged; pain quite gone; pulse good; tongue clean.—Calom. gr. x. h. s. s.

5th.—Perfectly well.—Pulv. purg.—6th. Discharged.

CASE CXV.—*Acute Inflammation of the Liver; Intoxication; decided Depletions, &c.*

FRANCIS MARTIN, ætat. 23, admitted 20th May, at Hyderabad. Complains of pain in his side and belly; pulse quick and full; he appears to have been drinking, and is much confused in his intellect.—Mist. purg. ℥jv. stat.

Evening.—No better, but he cannot give any account of himself.—Calom. gr. xx. h. s. s.

21st.—The medicines have not had any effect; the pain is increased; pulse hard and sharp.—Apply thirty leeches to his side immediately. Pulv. purg. statim.

Evening.—Has been purged; motions very morbid and offensive; pain less.—R Pilul. hydr. cum calom. h. s. s. et haust. amar. cum sennâ, nocte maneque.

22d.—The pain in his side is very much better, but he complains of a sharp pain at the scrobiculus cordis, where he received a blow.—Apply eighteen leeches to the scrobiculus cordis. Mist. purg. ℥jv. stat. Cont. pilul. three times a day.

Evening.—He feels relieved by the leeches, but there is still pain; motions watery and offensive.—Apply eighteen leeches to the scrobiculus cordis. Cont. pilul. et haust. amar. cum sennâ, ut antea.

23d.—Much better; the pain is nearly gone; stools watery.—Cont. ut antea.

24th.—Has still pain at the scrobiculus cordis, but is much easier since the leeches were applied; pulse good and natural.—Apply a blister, and cont.

Evening.—The blister has removed the pain.—Cont.

25th.—Tongue foul in the centre; has no pain, except from the blister; motions more natural.—Cont. pilul. et haust. ut antea.

26th.—Feels perfectly well, except from the blister.—Omit pills. Cont. haust. ut antea.—28th. Discharged.

CASE CXVI.—*Active Hepatitis; Depletions.—Recovery.*

FRANCIS DEMOCK, ætat. 39, admitted 1st May, 1817, on the march to Hyderabad, complaining of sickness at stomach, giddiness in his head, and bitter taste in his mouth: he took an emetic last night, and threw up a good deal of bile; he now complains of a sharp pain in the right side, which prevents his breathing; pulse full, hard, and sharp; tongue excited and white.—Apply twenty-four leeches immediately, and give the purging powder.

Evening.—The pain is not much diminished; tongue foul; pulse rather languid, and

not so quick. — Calom. gr. xx. ; opii, gr. ij. Ft. pilul. h. s. s. Mist. salin. febrif. every two hours.

2d. — Considerably better ; tongue clean ; pulse regular ; says he is well. — Pulv. purg.

Evening. — Pain returned again this evening, and he has pain in his shoulder ; pulse quick and full. — Apply twenty leeches immediately. Repet. mist. Calom. gr. xx. h. s. s.

3d. — Pain all removed ; tongue clean. — Pulv. purg. statim.

Evening. — Well purged ; stools offensive and copious ; no pain ; tongue clean. — Haust. amar. cum sennâ, ℥iij. nocte maneque.

4th. — Perfectly well. — Cont.

The draught was continued till the 6th, when he was discharged for duty.

Remarks. — The emetic was evidently prejudicial. It would not have been given if the tendency to inflammation had been decided. It, however, developed and made the disease more evident.

CASE CXVII.

HENRY TOOL, ætat. 26, admitted 2d May, 1817, on the march, at 4 o'clock, P.M. Complains of excessive pain at the scrobiculus cordis, and across the hypochondriac and epigastric regions, which interrupts his breathing ; pulse hard and small ; tongue white and rather dry ; was seized a few hours since, on the march. — Apply twenty-four leeches immediately. Calom. gr. xx.

2d. — Pain quite gone, and in every respect better. — Mist. purg. ℥jv. statim.

Evening. — Fully purged, and free from pain. — Repet. calom. gr. xij. h. s. s.

3d. — Feels quite well this morning. — Mist. purg.

4th. — No complaint. — Repet. mist. purg. — 5th. Discharged.

SUB-SECTION II.

Of the Treatment of the more Chronic Forms of Inflammation of the Biliary Organs.

THE chronic forms of hepatitis we have already shewn to be essentially similar diseases to the more active varieties, and only to differ in the duration of the disorder, and in the texture of the organ more generally the seat of the inflammatory action. We have also shewn, that when inflammation of the internal structure of the organ assumes an active character, it ought not to receive the appellation of chronic, merely because it evinces no very acute or very painful symptom: as respects its nature, duration, and consequences, it is as much an acute disease as that form of hepatitis which is seated chiefly in the surface of the organ. We have also considered it right to direct the practitioner's attention to the fact, that no general proposition regarding the condition of the biliary secretion should be confided in: for although this secretion is generally in smaller quantity, more remarkably changed from its healthy characters, and more frequently obstructed, when the inflammation is seated in the internal structure, than when the surfaces are the seat of disease,—yet the exceptions seem to be numerous, and forbid any reliance being placed upon this circumstance, as forming a basis for an indication of cure. Another circumstance, for which we have argued as being of importance in the treatment, and hence deserving a slight notice at this place, is, that the division of hepatic diseases into acute and chronic is entirely arbitrary, and should be adhered to only as far as respects the duration of disease. By many authors, however, it has been applied to forms of hepatitis, as now stated, which are essentially active, although, perhaps, they are not acute as respects the degree of pain accompanying them: and by others this term has been equally extended to those consequences of active disease which consist of various alterations of structure, rather than in slow inflammatory action. As, however, chronic inflammation very frequently remains after the active disease is subdued, and as nearly all the morbid

changes met with upon *post mortem* examination of the liver in India are more or less accompanied with, or related to, slow inflammatory action, either of some part of the liver itself or of the gall-bladder and ducts, we have included all these derangements under our observations on the history of chronic inflammation of this organ. We have been the more induced to the adoption of this plan by the desire of avoiding repetitions, into which we should have been inevitably led by the separate consideration of minor pathological conditions of this viscus; and by the consideration, that the greater number of those conditions, even did they admit of being recognised in practice, — (a recognition of remarkable difficulty; and which, if at all to be learnt, must be studied amongst numerous cases of disease,) — require similar modes of treatment, and nearly the same remedies, for their removal.

Vascular Depletions.—Whether chronic inflammations of the liver continue as a consequence of the active forms of hepatitis, or take place primarily, local depletions should be practised, according to the state of the pulse and the appearance of the tongue, and the habit and constitution of the patient. Reference also should be paid by the practitioner to the modes of living followed by the patient, and the length of time he has passed in a warm climate. If depletions have been decidedly practised in the active inflammations of the liver, they should be more cautiously resorted to in the chronic forms of the disease, which sometimes continue after the former have been subdued; but when they have been either entirely or in part neglected in the acute stages, local depletions should be directed with greater boldness in the chronic disease yet remaining, and be repeated according to the effects produced on the disease and on the state of the patient. After the leeches have ceased bleeding, poultices should be applied and frequently renewed; and calomel may be given at bed-time, as already recommended, and followed in the morning by a purging draught.

In those cases of chronic hepatitis which supervene without any previous acute disease, and particularly such as are accompanied with any evident degree of congestion and enlargement of the viscus, copious local depletions are especially required. This form of hepatic disorder is generally more or

less connected with accumulations of morbid secretions and of fæces on the mucous surface of the alimentary canal and in the cells of the colon, which dispose this surface to inflammatory irritation and ulceration, when acted upon by those morbid and acrid secretions of the liver characterising a very large proportion of the cases of this particular description of chronic hepatitis. The necessity of carrying off these accumulations, when treating this form of disease, at the same time that we endeavour to remove morbid action of the liver, and promote a free and healthy discharge of bile, must be apparent. When, however, the biliary and intestinal secretions are even partially disturbed by the means pursued, disorder will be heightened, as respects the feelings of the patient, until they are completely removed, by the repeated exhibition of purgatives. The purgatives may be selected for this purpose according to the circumstances and complications of individual cases; but, generally, a full dose of calomel given at bed-time, and any one of the aperient draughts already noticed taken early in the morning, will be found most beneficial. After we have accomplished this intention, the calomel may be changed for some milder mercurial preparation, as the blue-pill, or the hydrargyrum cum cretâ; and mild saline aperients with antimonials may be continued through the day, for the purpose of promoting the biliary and intestinal secretions, of removing obstruction when it is present, of determining to the surface of the body, and keeping up a gentle action in the bowels. In chronic cases of this description, dysenteric symptoms are not infrequently present. When such is the case, enemata, either of a purging or of an emollient nature, should be administered, and the pulvis ipecacuanhæ comp. given in combination with the blue-pill at bed-time, and be followed by a dose of castor oil in the morning. In many of these cases, much advantage will be derived from the use of a flannel bandage kept constantly applied around the abdomen; and the local depletions which have been practised may be followed by blisters on the epigastric or hypochondriac regions, and these by the nitro-muriatic wash, until a healthy state of the secretions be brought about.

The Nitro-muriatic Solution.—After the acute symptoms have been removed by decided treatment in the active forms of hepatitis, and after the means

now noticed have been employed in the chronic states of disease, this remedy should be resorted to, if any disorder still remain as regards the functions either of the liver itself or of the bowels. The hypochondria and abdomen should be sponged with it night and morning, or the feet and legs should be immersed in a bath prepared with it, as directed below.* We have experienced the most decided advantage from this medicine in the form and stage of disorder now under consideration; and, indeed, in all functional disorders of the liver. In the more chronic forms of disease of this viscus, more particularly such as are connected with enlargement of its structure, and a morbid state of the biliary and intestinal secretions, we consider it one of the most valuable remedies we possess. When this remedy is resorted to, it should be daily employed for some time, according to its effects; but it

* The nitro-muriatic solution, lotion, or bath, may be made in the following manner:—Into a common quart bottle put about eight ounces of pure water, to which add four ounces of the nitric acid, and four of the muriatic acid, of the strength of the London Pharmacopœia. The “*Nitro-muriatic Solution*” is thus formed, and the bottle containing it ought to be labelled accordingly. If it be intended to use this solution in the form of a bath, from two ounces of it to five, according to the strength of the patient, may be mixed with from two and a half to three gallons of warm water, of a temperature nearly approaching that of the blood, in a high and narrow vessel, and the feet and legs kept immersed in it for about twenty minutes or half an hour, every night before retiring to rest. If the bath does not occasion a pricking or itching sensation in the parts immersed, after twenty minutes have elapsed, the next bath should be increased in strength. Although we have frequently employed this bath, and generally with advantage, we prefer, in many respects, the practice of sponging the trunk of the body, particularly the abdomen, with the nitro-muriatic wash.

When the nitro-muriatic solution is to be employed in the form of a wash, from two to three drachms of the *Solution*, prepared as just stated, should be added to a pint of warm water, and the trunk of the body, insides of the thighs, &c. assiduously sponged with it; by means of a large sponge, for about a quarter of an hour daily; or, occasionally, night and morning. We have found great advantage from employing this solution also in the form of poultice, in torpor of the liver and in chronic affections of the organ, attended with enlargement and a deficient and morbid state of the biliary secretion. Occasionally, much benefit will arise from employing this wash in the form of fomentation; the water having been made as hot as 130° or 140° of Fahrenheit, when the acid solution is added. When this is practised, the flannels soaked with the wash should be applied for about an hour or two every night. It may be employed, also, with advantage by keeping cloths wet with the solution over the hypochondria and abdomen, and placing over them warm poultices; both the moistened cloths and the poultices being renewed from time to time.

should not be left off until after two or three weeks' trial, unless it shall have fulfilled the intentions with which it had been prescribed, before that time. Even after its use has been intermitted for some time, its effects will frequently continue to appear. In the more obstinate cases, therefore, advantage from it should not be despaired of, even after it has been laid aside; and although the first course of it may have been ineffectual, a second trial may prove decidedly beneficial. It may be employed in the form of bath, lotion or wash, fomentation, and poultice, according to circumstances, as already directed.

Whenever it is our intention to try the effects of this remedy, we should not give mercurials internally, either at the time or for some time afterwards; nor ought the nitro-muriatic bath to be resorted to immediately upon the adoption of a mercurial course; a short time should be allowed to elapse from the mercurial affection of the system, till the employment of this remedy is commenced. Purgatives, however, may be exhibited, from time to time, during the nitro-muriatic course, in order to carry off the secretions of the liver and intestines, which are liable to accumulate and occasion disorder. For this purpose the common purging powder, or the bitter purging mixture, either with or without salts, may be given occasionally, and the diet and regimen regulated in the same way as we have stated in our observations on the treatment of diseases of the stomach, and as we shall have to remark in the sequel. The nitro-muriatic solution may be employed in any of the modes we have recommended it, either with a view of restoring the healthy functions of the liver and abdominal viscera, after an acute attack of hepatitis, or with the intention of promoting and correcting the secretion of bile in chronic disorders of the liver, and in those derangements which are attended with more or less of structural derangement, whether of the biliary organs themselves or of the adjoining viscera. We have frequently observed, after it has been employed for a few days, that the patient has complained much of heaviness or drowsiness. When this is the case, active purgation should be instituted, in addition to the use of the solution, which will soon bring away morbid and offensive stools, and remove this symptom of disorder. Where abscess is already formed, we can scarcely expect any advantage from the

nitro-muriatic solution, more than from any other remedy. But as our *post mortem* examinations have shewn us that abscess has been occasionally formed in the liver, and afterwards absorbed, the structure of this organ having been nearly restored to a healthy state, even where the previous existence of abscess was most evident,—we should not despair of the patient's recovery, as long as the energies of the system admit of being kept up by means of suitable treatment.

During the nitro-muriatic course, considerable advantage will often be derived from the change of air to a moderately cool and pure climate, provided that the change be made with due precaution, and neither suddenly, nor to the extent of affecting materially the sensations of the patient: a feeling of cold ought not to be occasioned by the change, and the patient should not be placed out of the way of the best medical advice. A sea-voyage or excursion, when the advantage of medical care can be enjoyed at the same time, is very often serviceable: but if the voyage be to a colder climate, great care is often requisite on the part of the patient, and much science on that of the medical attendant, to prevent a relapse of the disease.

The Nitrous Acid.—This medicine has been long employed in India, in a state of weak solution, as a common drink in hepatic diseases, and as an alterative remedy, with the intention of promoting the secretion of bile, and restoring its healthy character. For this purpose the dilute nitrous acid may be used largely, and carried as far as six drachms in the twenty-four hours. After some time, generally three or four days, it usually occasions a slight salivation; but its beneficial effects are often produced when given in smaller quantities, without this operation on the salivary glands. The nitrous acid generally requires a longer use than mercurial remedies, in order to obtain its good effects. Sir James M'Gregor, in his very interesting account of the diseases of the 88th Regiment, (see *Edin. Med. Journ.* vol. xvii.), appears to consider it equal to mercury in the cure of hepatitis. We believe that it is, on many occasions, a safer remedy than mercury; as regards the manner in which this latter medicine was usually prescribed at the time he wrote. Although we have frequently been inclined to question the pro-

priety of directing a course of the nitrous acid when mercurials were being exhibited, yet we never saw cause in practice to suppose that any bad effect arose from the continued exhibition of both these remedies within a few hours of each other. Indeed, in many cases we have had reason to agree with Sir James, and to consider the combined operation of mercurials, especially when employed externally, and of the nitrous acid internally, as being more beneficial than the use of either of them separately.*

To attempt to affect the system with mercury in the active forms of hepatitis, or in many cases of the chronic disease, before the inflammatory action is sufficiently subdued by the more energetic antiphlogistic remedies, we consider to be the cause of its often failing to remedy the disease; and we are confident that when thus prescribed, it is frequently prejudicial, and even calculated to increase the disposition of the diseased organ to run into abscesses. This objection does not, however, apply to the use of nitrous acid, nor to that of the nitro-muriatic acid solution; and although these remedies are chiefly beneficial after the more acute symptoms are subdued in the more active forms of hepatitis, and should therefore only be employed when this indication has been effected, yet the earlier use of them will not be productive of any bad consequences. In the chronic forms of hepatitis, and in most of their attendant organic lesions, they may be serviceable, in assisting the absorbent vessels to remove morbid depositions, and in promoting a healthy state of function in the secreting glands and surfaces engaged in the actions of digestion.

* It will be, however, much safer not to exhibit the nitric acid at the time of prescribing mercurials internally. The practice which we have always observed, of giving only one large dose of calomel in the twenty-four hours, at the time of repose, and of using the nitrous acid only through the day, a purgative draught having been administered early in the morning, may have prevented any ill effects from arising out of the employment of both these active remedies. The oxides of mercury, whether in the form of blue-pill or in any other form, certainly ought not to be prescribed when the patient is using any of the mineral acids, either in the form of a common drink, or in conjunction with infusions; mischief may result from the practice, without being observed, or its consequences may be mistaken for those of the disease.

Blisters.—In the treatment of the more acute forms of inflammation of the liver, blisters ought never to be resorted to, as we have already remarked, until after vascular depletions have been employed so decidedly as to subdue the inflammatory action present. When this has been accomplished, then blisters are often of great service, and tend both to prevent a relapse, and to restore the healthy function of the diseased organ. In the form of acute hepatitis which accompanies or supervenes to congestion and torpor of the liver, blistering repeatedly, according to circumstances, is generally beneficial. If, however, blisters are employed too early, and before the inflammatory action has been reduced, they often tend to prolong this action,—and thus a reiteration of the depletory measures is required for its removal. Even in the more chronic forms of the disease, blisters are seldom of much service until local depletions, poultices, and purgatives, have been employed: after these they are generally productive of much advantage.

Setons or Issues.—In the more protracted cases, and where we have reason to suppose, either from the duration of the disease or the presence of enlargement, that organic change exists in the liver,—the insertion of a seton or issue is often necessary. After a discharge has been established from them, poultices applied directly over them, and frequently renewed, are generally beneficial. They should be made much below the region of the liver, and so far anteriorly as to allow the patient to dress and attend to them himself. Like blisters, they should follow the depletory measures already recommended.

Tepid Bathing and Vapour Bath are serviceable during the course of the disease, whether in its active or chronic forms, more especially after depletions have been prescribed. In the chronic forms of the disease particularly, they should be followed by frictions, either with a coarse towel or the flesh-brush, immediately upon coming out of the bath. When a full bath cannot either be procured or taken, the semicupium, hip-bath, or even simple pediluvia, are serviceable. Since we have been in England, we have had occasion to know that the sulphur and chlorine baths have proved serviceable in some

chronic cases of great obstinacy, as an auxiliary to a judicious use of deobstruent aperients and alteratives.

The simple vapour baths should be first resorted to; and if benefit be not derived from the use of them, then the sulphur or chlorine fumigation baths may be tried. These latter have not yet been introduced into India, as far as we know; but they may be easily constructed, so as to answer the purpose of trial in a few cases, from whalebone-frames covered with oil-skin, with two or three articles of additional convenience obtained from the usual utensils of domestic economy. These baths, which are now numerous in London, ought not, however, to be confided in as a principal means of cure, but merely as a useful auxiliary to other remedies; and they should be directed by the physician under whose care the patient is at the time, who will prescribe for him the kind of bath of which he should make trial, and a treatment and regimen suitable to the particular circumstances of his case.

Of Emetics.—Although emetics are extremely serviceable in cases of simple accumulations of bile in the biliary passages, yet where any inflammation of the liver exists, or even a tendency to it, the acute character of the disease is generally increased by their exhibition. In many cases of latent disorder of the liver, where inflammatory action smoulders on in the parenchymatous structure of the organ without occasioning any very manifest symptom of its existence, the action of an emetic, although tending to increase the disease, renders it much more manifest as respects both its nature and relations, and thus, in many instances, leads to the adoption of a decided treatment, which might otherwise have never been resorted to. When emetics are exhibited in hepatitis, they often afford relief for a short time after their operation; but the inflammatory symptoms are soon afterwards increased, if they previously existed; or in the more chronic cases, where they never were very manifest, they become for the first time developed. We have not infrequently seen cases of active hepatitis, which had apparently been subdued, return with much violence, and those consisting merely of chronic disorder changed to very active disease, after the operation of an emetic. Even after all inflammatory symptoms have been quite subdued, whether in the active

or chronic forms of hepatitis, the exhibition of an emetic is hazardous. The object with which they are generally given,—namely, to remove accumulations of bile, as indicated by nausea, bitter taste of the mouth, with clamminess, &c.—is much more safely obtained by means of purgatives and cathartic enemata. Although we thus dread the operation of emetics, where inflammatory action is or has been apparent, yet we believe that they prove indirectly serviceable in many cases where, but for their exhibition, no symptom of inflammation sufficient to awaken the attention of the practitioner would have appeared, and hence the treatment requisite to remove the disease would not have been adopted.

Of the Use of Eccoprotics, Aperients, and Deobstruents.—In the more chronic cases of hepatic disease, in addition to the external means already recommended, and particularly after local depletions have been resorted to whenever pain or uneasiness in the region of the liver manifested itself, a gentle aperient pill should be taken at bed-time, and saline laxatives through the day. The best pill which we can recommend for this purpose is that composed of the aloës and myrrh pill and blue-pill, or the following:—℞ Hydr. submur. ʒj.; extract. colocynth. comp. ʒij.; antim. tartar. gr. j.; pulv. ipecac. gr. jv.; sapon. Castil. gr. x.; ol. car. q. s. M. ft. pilul. xvij. Two of these will generally be found to operate sufficiently, and may be taken every night at bed-time, or every other night. In the majority of cases, however, one of them will prove sufficient, particularly when it is intended to continue the use of them for a considerable time, and when saline or other laxatives are also required through the day. Where the chronic disease of the liver is attended with enlargement, it will generally be found requisite to prescribe the above pills every night, the nitro-muriatic wash being employed externally night and morning; and a weak solution of the sulphates of soda, magnesia, and potash, either singly or combined, may be given in the morning, and, if necessary, again at mid-day, in order to keep up a gentle action in the large secreting viscera and bowels. If, however, a weak solution of these salts should occasion frequent and watery motions, with tenesmus, they may be changed for the solution of cream of tartar in tamarind water, or for the solution of the soda tartarizata, or the tartras potassæ. On many occasions,

the factitious Cheltenham or Harrowgate salts may be given with advantage; and the Seidlitz powders may also be taken occasionally. Much benefit will generally accrue from changing, after a few days, the saline substances prescribed, particularly if the exhibition of the eccoprotic pill at bed-time, and the salts through the day, produce any degree of tenesmus. The cream of tartar solution may, however, be given and continued for a longer time, without any risk of inducing this effect. If tenesmus occur, an emollient enema will always afford relief, and the medicines may be intermitted for a day or two.

During this course the diet of the patient should be light, cooling, gently nutritious, and chiefly consisting of farinaceous articles of diet. Spirituous, vinous, and fermented liquors ought to be rigidly avoided, and he should take gentle and regular exercise, according to his strength.

Of the Employment of Tonics, &c. — After suitable evacuations have been resorted to, and during the continued operation of deobstruent aperients, the patient's strength ought not to be allowed to sink. While the appetite is but slightly impaired, little more is necessary than a gently nourishing diet, chiefly of farinaceous food; but when the appetite flags, and the energies of life begin to fail, gentle tonics, in the form of infusion, are then generally beneficial. These ought to be made the vehicle for the saline remedies now mentioned; and by combining, in this manner, the tonics with the saline aperients, we fulfil the double intention of supporting the energies of life while we remove obstruction, and carry off morbid secretions and accumulations. Of the tonics which may be employed, few are more serviceable than the infusion of calumba, the cold infusion or the decoction of cinchona, the compound infusion of gentian, or the infusion of camomile flowers. These may be given in various forms of combination, according to the particular circumstances of the case; but they ought never to be resorted to while any lingering disposition to inflammatory action can be traced, nor at any time should they be employed early in the disease.

When we wish to change, either during the progress of the disease, or at the commencement of convalescence, from a depletory or antiphlogistic

treatment to that which is less depressing to the powers of life, saline diaphoretics, the decoction of sarsaparilla with the sub-carbonates of the alkalies, or a weak infusion of calumba or of gentian with the sub-carbonate of soda, soda tartarizata, or the acetate of potash, should be first tried, in the order now enumerated. If these be borne with advantage, and if the functions of digestion and the strength of the patient seem to require their aid, tonics of a more active nature may be given; but these should be exhibited with caution, and generally be combined with the saline substances already recommended. The best adjuncts to tonics given with saline medicines are, the spiritus ætheris nitricus, the tinctura cardom. comp., or any of the preparations of this class. When, with disease of the biliary apparatus, there evidently are accumulations of fæces and morbid secretions in the bowels,—a complication of disease extremely frequent in India,—the tonic infusions now mentioned are very beneficially combined with the compound infusion of senna, and given either without any further addition, or with some salts and the compound tincture of cardomoms and spiritus ætheris nitricus.

When tonics are prescribed early in the disease, or before sufficient evacuations have been practised, they frequently tend to prolong disorder, although their exhibition may be attended with benefit for a short time. But in hepatic diseases more particularly, present advantage ought never to be sought at the expense of an increased duration of this disease, with all its consequences.

In many of the slighter chronic affections of the liver, the appetite continues unimpaired, and occasionally it is more ravenous than usual. In such cases, the function of digestion is but imperfectly executed, and an unhealthy chyle is generally formed, which, with the quantity of food taken, tends to feed the disease which it is the object to remove. The practitioner, in order to treat the disorder successfully, must be strict in his regulations respecting diet and regimen in those cases, and must resort to a steady employment of purgatives for a considerable time.

During convalescence, the diet of the patient ought to be a chief object of attention, both on his own part and on that of his physician. Nothing

tends more to cause the active forms of hepatitis to pass into the chronic states of disorder than the indulgence of a too liberal or an improper diet; and nothing, in the more chronic diseases of the biliary organs, is more efficient in prolonging the morbid condition, or in converting it into one of an acute form, than similar habits, more particularly if they be connected with the use of spirituous, vinous, or fermented liquors. It may be added as a general observation, that the desire of these indulgences is often combined with, if it does not actually spring from, chronic disease of the digestive organs, more particularly of the biliary apparatus. Hence the necessity of attending to the necessary restrictions respecting diet and regimen, not only during the period of the continuance of disease and convalescence from it, but even ever afterwards: for, where disease of the hepatic organs has once existed, there is a continued tendency to its return thereby induced, whenever the exciting causes are sufficiently powerful for the purpose; and there certainly exists not any more efficient cause in producing this effect than the indulgences of the table, especially when conjoined with the influence of a warm climate and a sedentary mode of life.

CASE CXVIII. — *Chronic Hepatitis, with Disorder of the Bowels, great Debility, &c. ; illustrating a frequent Form of the Disease in India. — Recovery.*

WILLIAM CONOLLY, Madras European Regiment, had been some time in hospital at Trichinopoly for chronic inflammation of the liver, for which he has been leeches, and gone through two different courses of mercury, with tolerably good effect; for the last month he has been put on the purging discipline; he is much recovered; his evacuations are perfectly natural, and formed; he has no pain in his side; pulse small; no appetite; he has taken, for the last ten days, nitrous acid, which he thinks does him good. — Repet. acid. nitros.

2d. — His evacuations are of a pale colour and rather frequent, but perfectly natural in consistence; he feels better on the whole, but complains of slight pain in the right hypochondrium. — Pil. hydrarg. no. 1. h. s. Repet. acid. nitros. ut antea. Mist. amar. cum sennâ, ʒij. h. s.

3d. — The symptoms and treatment as before.

4th. — Received a slight hurt on his side last night, which has occasioned more pain than usual; his evacuations are much more natural, and on the whole he seems better. — Repet. pil., mist. amar., et acid. nitros.

5th. — Feels much easier this evening; was purged four times; stools of clayey consistence, and rather pale. — Repet. pil. et haust. mane nocteque. Ap. emplast. lyttæ lat. dex.

6th. — His side is easier since the blister; bowels quite regular. — Repet. pil. hydrarg. et haust. ut antea.

Evening. — Has had a sensation as if something had fallen down into the lower part of his belly, but was not immediately purged; has had some stools of a variegated appearance, and not unlike the yolk and white of eggs mixed together, with some feculent matter; he feels much easier. — Cal. gr. viij. h. s.

7th. — Purged six times in the night; stools as formerly, light brown and watery; pain in his shoulder continues, but that in his side is diminished; very little fulness. Repet. pulv. purgans. Calom. gr. xij. h. s.

8th. — Had no stools in the night; feels easier. — Pulv. purgans. Calomel. gr. xij. horâ somni.

9th. — Feels very sore, and a fulness in the left side; pulse small, and 90; had no stool in the night. — Pulv. purg. stat. sumend.

11 o'Clock. — Powder did not operate. — Repet. pulv.

Evening. — Has been slightly purged; stools bilious and watery; the pain in his side is not so severe as it was this morning. — Cal. gr. xij. h. s.

10th. — Symptoms and treatment as on the 9th.

11th. — Feels better altogether. — Repet. med.

12th. — The pain is gone; stools perfectly natural; pulse small and frequent; he has no appetite. — Cont. med.

13th. — Feels no pain, and the soreness is less. — No medicine.

Evening. — Mouth sore; bowels regular.

14th. — He is better to-day. — R Infus. sennæ, ℥jss.; infus. amar. ℥iij.; tinct. sennæ, 5ij. M. ft. haust. stat. sum. et repet. vespere.

15th. — Continues to improve. — Cont. med.

16th. — Recovering fast; stools quite natural. — Cont. med. R Ol. vitriol. ℥xx.; aquæ puræ, ℥xij. M. ft. mist. Capiat cyathum, p. r. n.

17th. — Feels extremely weak this morning. — Aquæ ammon. ℥xxx.; tinct. opii, ℥xl.; aquæ puræ, ℥jss. M. ft. haust. stat. sumend. Pulv. purg. et enema purg. vespere.

18th. — Feels better; was purged; pulse quick; no pain; very little appetite, and very weak. — R Decoct. cinc. lbj.; tinct. cinc. ℥j.; acid. vitriol. dilut. ℥xxx. Ft. mist.; a wine-glassful every hour.

19th. — An unusual languor and debility seized him this morning; pulse exceedingly

quick and fluttering; no inclination to eat; bowels quite regular. — Give him nourishment, and four glasses of wine. Cont. mist.

20th. — Passed a restless night; pulse 90; stools natural; feels some pain in his right side. — Mist. salin. febrif. ℥ij.; spirit. æther. nitros. ʒss. M.; a wine-glassful every hour. Repet. vin. ut antea.

21st. — Had a good night, and feels better; has passed some green, inspissated bile, perfectly distinct from his stools, which are of a brown colour; pulse quick (he has been walking), 102 in a minute; appetite better. — Cont. mist. salin. et omnia.

22d. — Improving; pulse 90. — Cont. omnia.

Evening. — Gripping pains in his belly. — Mist. purg. ʒij. stat. sumend.

23d. — The pain in his belly is removed, and the medicine operated freely. — Cont. mist. salin. — 24th. Feels weak. — Cont. omnia.

25th and 26th. — Has no complaint but pains in his loins. — Cont. omnia.

27th. — Pulse small and quick; much better; tongue clean; stools perfectly natural. — Decoct. cort. Per. ℥ij. in die. Acid. nitros. ut antea.

28th. — Stools very green. — Ol. ricini, ʒij. mane sumend. Cont. omnia.

29th. — Stools perfectly natural; he only requires strength. — Contin. omnia.

30th. — No complaint but weakness. Discharged, but takes his medicine.

Remarks. — The circumstances chiefly deserving notice in this case are the advantage derived from the use of the nitric acid and of aperients; the aggravation of the pain in the side and other symptoms, from the examination made on the 3d; the disorder of the bowels and state of the motions, particularly those voided on the evening of the 6th; and the very quick state of the pulse. He afterwards recovered after a long convalescence. There was evidently, in this case, great tenderness, and, perhaps, softening of the organ.

CASE CXIX. — *Chronic Hepatitis, Torpor of the Liver, and Morbid Accumulations in the Bowels, &c.*

JAMES BROWN, ætat. 45, pensioner of His Majesty's 80th Regiment, admitted into the General Hospital 26th October, 1820, in the afternoon. Complains of sickness at stomach, and purging; motions watery, and of a pale yellow; pulse good; skin natural; an uneasiness, but no pain, in the right side; tongue excited, rather clammy; he has been subject to liver complaints. — R Calom. gr. x.; opii, gr. j.; syrup. q. s. Ft. pilul. h. s. s. Mist. purg. ʒjv. cras mane sumend. Spoon diet.

27th. — Complains of thirst; medicines operating; stools pale-yellow colour, and watery; tongue cleaner. — R Pilul. aloë. cum calom. et ipecac. no. l. ter in die.

Haust. amar. cum sennâ, ℥iij. nocte maneque. Mist. salin. febrif. ℥j. every two or three hours.

These were continued till the 30th, with the same effects, when the motions were changed to a mixture of green and yellow, were more consistent, and very copious; pulse 60, firm and regular; tongue excited and white; skin natural; feels less uneasiness in his side. — Cont. ut antea.

31st. — Motions feculent, copious, light clay-colour, and very offensive; says he is much better; pulse 56; skin somewhat dry; tongue more furred; no thirst. — Cont. ut antea.

November 1st. — No bile in the motions; pulse 50, rather oppressed and soft; tongue white; free from uneasiness. — Cont.

3d. — Motions copious, perfectly consistent, and of a pale, chalky, clay-colour; his spirits are much improved, and he feels infinitely better; the medicines give him two or three motions every day; appetite tolerably good; tongue furred. — Cont. ut antea.

7th. — Motions of a light-yellow colour, extremely offensive, copious, and feculent; says they scald him when passing; tongue much cleaner. — Cont.

8th, 9th, and 10th. — Motions varied in colour, sometimes marked with bile, at other times not; pulse never above 50; says he feels no complaint, and has a good appetite; the tongue, however, still continues foul. — Cont.

11th. — Motions of a much darker-yellow colour than they have been yet; felt some tightness and uneasiness at the præcordia last night; pulse 54. — Cont. pilul. alter. ut antea. Omit the haust. amar. cum sennâ, and give ℔j. Cheltenham water.

12th. — Stools feculent, copious, and of a more natural appearance. — Cont. ut suprâ.

13th. — Stools extremely offensive, tenacious, and viscid, and of a darker colour than we have yet seen them; tongue much cleaner and more natural; skin cool, rather moist; pulse 50; he says he is well, but there appears a heaviness and indifference about him that does not bespeak health. — Cont.

14th, 15th, 16th, and 17th. — The motions continue exceedingly offensive, and in greater quantity than we could imagine; there is still a heaviness about him, though he makes no complaint. — R Extract. colocynth. gr. x.; calom. gr. x.; ol. anisi, ℥iij.; syrup. q. s. Ft. pilul. iij. h. s. s.

18th. — Had several blue clay-coloured, copious, and extremely offensive motions, from the pills; tongue much cleaner; pulse 60. — Repet. pilul. ut antea.

19th. — Tongue quite clean; countenance more cheerful; stools copious and more natural. — Haust. aquæ Cheltenhamii, ℔j.; et repet. pilul. h. s. s.

20th. — Motions natural; no uneasiness of any kind. — Repet. haust. amar. cum sennâ nocte manequæ; which was continued, with an occasional pill, till the 27th, when he was quite well, and discharged.

Remarks. — The foul state of the tongue indicated, in a very clear manner, the accumulation of morbid secretions and fæces in the alimentary canal. The very slow state of the pulse was also a symptom of the same kind of disorder. The pulse, it may be remarked, rose after the morbid secretions were removed by purging. The pale state of the motions, as well as the other symptoms, indicated the propriety of an alterative course of mercury, and the decided employment of purgatives. The advantages which were apparent from these remedies rendered the trial of any other unnecessary.

CASE CXX. — *Chronic Disease of the Liver; copious Draughts of warm Water, Nitro-muriatic Solution, &c.—Recovery.*

MADRAS, August 1819. — Mr. S—— had been labouring for some time under chronic disease of the liver and irregularity of his bowels, for which he had been obliged to take sea-voyages, &c. On the 26th August the author was called to see him. He had been taking the compound infusion of gentian with salts every morning, and five grains of the blue-pill, with one of James's powder, at night. On the 27th the following symptoms were noted: — Heaviness about his eyes; great irregularity of bowels; headach, particularly in the morning, when his stomach is empty; pulse rather sharp; tongue clean; fulness in the right hypochondrium, and some pain on pressure. — R Infus. amar. ℥xij.; infus. sennæ, ℥vj.; tinct. cardam. comp. ℥iij. M. ft. mist. Capiat cyath. vin. nocte manequæ. Infricetur unguent. mercur. ʒj. cum camph. nocte manequæ.

28th. — The medicine had very little effect, and there is no alteration; his headach returned, with a drowsiness and listlessness. — Cont. omnia.

29th. — Headach exceedingly severe this morning; some intolerance of light; a slight degree of suffusion; nausea at stomach; pulse sharp; considerable drowsiness. — Apply sixteen leeches to the temples and towards the base of the skull. Cont. mist. ut antea.

30th. — Head very much relieved by the leeches, but he complains of great sickness in the morning, and vomiting. — A pint of hot water to be taken early in the morning. The mixture operates four or five times a day. Cont. omnia.

31st. — Sickness continues ; medicine operates too often. — Repet. mist. omni nocte, et aqua calida mane.

September 1st. — Sickness less ; head better ; bowels regular. — Cont. omnia.

2d. — Considerably better in every respect. — Cont. ut antea. Nitro-muriatic wash for the abdomen night and morning.

3d. — Three evacuations in the morning ; less sickness ; no headach ; feels much better. — Cont. ut antea.

4th. — No sickness ; no headach ; took cold water this morning, and coffee afterwards ; feels quite well, and his countenance is clear. — Cont. omnia.

5th. — Felt very sick this morning, and had a disagreeable taste in his mouth, but it went off in a few hours. — Cont. mist. ut antea.

6th and 7th. — Considerably better ; stools of a dark colour, and tenacious. — Cont. omnia. — 8th. Continues to improve. — Cont.

9th. — Attended to business yesterday, but was very languid ; he has no sickness or headach, and his bowels are regular. — Cont.

At the recommendation of his friends, he left Madras, for change of climate, very greatly improved ; but this change was undertaken much too early in the treatment, and against our recommendation. He continued to improve, however, for several months ; but proceeding, without due precaution, to a colder climate, where he had not the advantages of the necessary comforts and medical advice, he experienced a return of the disease.

CASE CXXI. — *Chronic Hepatitis ; disordered Action of the Liver complicated with Disorder of the Alimentary Canal ; treated by Purgatives and Alteratives.*

THOMAS WALKER, private, Madras European Regiment, ætat. 18, admitted the 8th January, 1814. Has been complaining for some days of pain and fulness in his stomach and belly, with occasional purging. He has taken some aperient medicine without any good effect, and he came this evening to the hospital. — Calom. gr. xij. h. s.

9th. — Had two small, crude stools in the night, and feels, he thinks, easy this morning, though he still complains of pain about his stomach ; pulse good ; belly soft. — Pulv. purg. stat.

Evening. — Has been purged three or four times ; stools watery and crude ; feels much relieved. — Calom. gr. xij. h. s.

10th. — Complained of a good deal of pain in his belly during the night; has had two small motions, of a light-green colour. — Pulv. purg. Enema purg.

Evening. — Purged four times; stools a pale, dirty-brown colour, and watery; pulse good; skin cool, but he complains of sharp pain in the belly. — Apply twelve leeches immediately, and give twelve grains of calomel.

11th. — The leeches bled well; he is much easier; was not purged in the night; there is still some soreness over the belly. — Apply a blister over the abdomen. Give a purging powder and an enema every three hours until a full operation is produced.

Evening. — Purged four times; motions watery, and of a light-brown colour; the blister is doing its duty, and the pain, he thinks, is easier. — Calom. gr. xij. h. s.

12th. — Was not purged last night; he feels much easier this morning. — Pulv. purg. statim.

Evening. — Purged five times; stools muddy, with some lumps of hardened fæces; feels much easier. — No medicine.

13th. — The pain in his belly is much less; he had one tolerably good motion in the night; but he complains of a bitter taste in his mouth, with sickness at stomach. — Mist. emet. stat.

Evening. — Vomited a great deal of yellow bile; the bitter taste in his mouth is diminished; he complains of headach. — Calom. gr. xij. h. s.

14th. — Stools this morning are of a pale, cream colour; he has no pain in his belly, but he still complains of headach, and has a bitter taste in his mouth. — Mist. purg. \mathfrak{z} ij. statim.

Evening. — Stools more copious, and very feculent, crude, and offensive; pulse quick; his headach is diminished, but he now complains of pain in his left side. — Calom. gr. xij., and apply a blister to the side.

15th. — Purged a good deal; motions curdled and bilious; the blister has risen very well, and the pain in his side is less, but he complains of pain in his head. — Repet. mist. purg. \mathfrak{z} ij. stat., and let it be repeated every two hours till it operates. Apply a blister to the nape of the neck.

Evening. — Purged four times very fully; stools very feculent, black, and offensive; feels much better; the blister has done its duty. — Calom. gr. xij.

16th. — Pulse good; less pain in his head and belly, but he says the pain in his side distressed him in the night; tongue blanched and excited, and his thirst is urgent. — Repet. mist. purg. \mathfrak{z} ij. R Mist. salin. febrif. \mathfrak{lbj} .; antim. tart. gr. j.; spirit. æther. nitros. \mathfrak{z} ss. M.; a wine-glass every two hours.

Evening. — Stools crude, copious, and watery; much better. — Cont.

17th. — The pains, he says, are all removed; he only feels weakness; the irritation of the blister makes him feverish. — Cont. mist. salin. ut antea.

Evening. — Bowels regular; motions pale-coloured; pains all gone. — Cont. mist. salin.

18th. — Improving daily; stools quite natural; no pain. — Cont. mist. salin.

19th. — Stools this morning watery, of a pale colour, with some hardened faeces floating in them; feels better. — Mist. purg. Cont. mist. salin.

Evening. — Much better; stools natural. — Cont. mist. salin.

20th. — Better. — Cont. mist. salin.

Evening. — Purged a good deal in the day and griped, but he feels much better this evening. — Cont. med.

21st. — His tongue is dry, but he has no pain; stools copious and watery. — Mist. amar. cum sennâ, ℥ij. night and morning.

22d. — Better; four watery stools in the day; has a better appetite. — Cont.

23d. — Pilul. hydrarg. gr. v. h. s. Repet. haust. amar. cum sennâ.

24th. — Stools feculent, and more natural; no headach. Complained of pain in his belly, and passed some white watery motions. — Cont. — 25th. Improving. — Cont.

26th. — Motions watery. — Pulv. rhæi, gr. vj. at noon.

27th, 28th, and 29th. — Improving.

30th. — Pain returned in his belly. — Repet. calom.

31st. — No material change; has not been purged. — Pulv. purg.

Evening. — Much better; has passed some green matter. — Repet. calom. h. s. s.

February 1st. — Was purged a good deal in the night, and passed some dark-green matter, not at all tenacious or like mucus; he feels much better this morning. — R Tinct. rhæi, ℥ss.; tinct. gent. ʒj.; tinct. card. ʒij. M. ft. haust. stat. sumend. et repet. vespere.

2d. — Had one small evacuation in the night; he feels much easier and more comfortable. — Cont. haust. ut antea.

3d. — Purged very much in the night; feels exhausted. — R Mist. cretæ, ℥vj.; confect. aromat. ʒj.; tinct. opii, ʒj.; tinct. catechu. ʒj. M.; a table-spoonful every two or three hours. N.B. This was ordered by one of the assistants, but immediately discontinued.

Evening. — He passed a great deal of viscid, dark-coloured mucus, but he feels better. — Repet. haust. rhæi.

4th. — No alteration. — Repet. haust. cum pulv. rhæi, ℥ss.

Evening. — Passed a very large, clay-like motion, with a good deal of water.

5th. — Feels very easy, but had no motion in the night. — Cont.

Evening. — One natural stool. — Cont.

6th. — Passed a restless night, and was purged a good deal; passed some hard and clay-like fæces. — Ol. ricini, $\bar{3}j$.

Evening. — Feels easier; motions yellow and bilious. — Pilul. hydrarg. no. 1. nocte maneque.

7th. — Stools more feculent. — Cont.

10th. — Stools becoming perfectly natural, and he is free from all complaints. This was continued, with the bitter aperient draught occasionally, till the 26th, when he was perfectly recovered and discharged.

SUB-SECTION III.

Of the Treatment of Abscess of the Liver.

WHEN we have reasonable grounds for believing that abscess of the liver is actually forming, the treatment should be, in some respects, modified accordingly. The symptoms characteristic of abscess, and the histories we have detailed in the section upon that subject, will materially assist the inexperienced practitioner in forming an opinion as to the presence of this termination of inflammation of the liver,—if termination it may be called. But it should be kept in recollection, that although matter may be actually forming, the inflammatory action which produces it does not cease altogether with this event. In some cases it continues with considerable activity until the abscess either makes its way externally or communicates with some internal viscus; whilst in others it subsides considerably, the circulation exhibiting merely the irritable character and hectic symptoms usually marking the formation or the existence of matter in parenchymatous structures.

Even when we have ascertained that abscess is actually formed, we should endeavour to control, as much as may be in our power, the state of the vascular action, either locally or generally; and when we find, from the

presence of pain, excited state of the tongue, and character of the pulse, that inflammatory action is considerable, we should reduce it by means of small local depletions, and a cooling and febrifuge treatment and regimen. Our object in this mode of procedure is to prevent the extension of mischief, by lowering the cause from which it proceeds, without materially injuring the powers of life. Whilst this object is kept in view, we shall generally proceed as safely as the circumstances of the disease will permit. But the practitioner must be upon his guard against allowing the above means to depress the powers of the system too far: the intention is to diminish morbid action, yet at the same time to preserve power; and provided this end be accomplished, it matters but little in what way we bring it about. When it is necessary to diminish the morbid action from which the purulent collection proceeds, the diet and regimen of the patient must receive considerable attention from the practitioner: even at the time that he depletes locally, and prescribes aperients with the view of carrying off the morbid secretions and faecal accumulations, which always increase disorder when allowed to remain,—he sees the necessity of supporting the energy of the stomach by means of a gently nutritious and cooling diet, allowing the patient no more than the power of his digestive organs can properly dispose of. When these powers fail, he endeavours to rally them by the assistance of gentle tonics combined with refrigerants, such as the nitrate of potass or the mineral acids; knowing well, that if the energies of the vital organs are allowed to sink in the struggle they have to endure against the organic mischief going on in the liver, the purulent formation becomes the more extensive and formidable,—the substance of the organ yielding before it, and becoming farther diseased the more that the vital powers of the vessels of the organ are diminished.

When, therefore, the general tumefaction and throbbing in the hepatic region, which accompany the early formation of abscess, are considerable, and attended with any degree of pain, firmness of pulse, and excitement of the tongue, local depletions should be instituted, and repeated to an extent which the particular circumstances of the case will point out. When these symptoms are present, and the patient has not had rigors, or cold sweats,

or formication, or fainting sensations, or a sense of sinking, with anxiety at the *scrobiculus cordis*, or night perspirations, then we have not sufficient reason to infer the actual existence of abscess, but it may be imminently impending. In this case our practice must be most decided, and should consist chiefly of large local depletions, which must be repeated until the symptoms of coming danger vanish, or as far as the powers of the system may admit. In those cases where the formation of matter is evident, and the fulness about the margin of the ribs or its vicinity is considerable, the treatment must necessarily depend upon what has been previously done. In these the employment of mercury ought to be entirely laid aside, excepting as a purgative; for attempts to affect the salivary glands with it will generally fail, will merely add irritation to an already irritable pulse, and materially injure the powers of the system—those very powers on which the future recovery of the patient most materially depends. If the local symptoms, and the state of the pulse and of the system, seem to require it, the application of a few leeches in the vicinity of the tumefaction will be generally serviceable; and afterwards poultices should be assiduously employed, with a view of promoting the external pointing of the abscess.

Although the continuance of mercurial preparations, after the existence of abscess is apparent, with any other view than that of carrying off the morbid biliary and intestinal secretions, (when calomel, in the manner in which we have particularly recommended it, is most suitable,) is improper, yet the nitro-muriatic solution may be employed in any of the modes we have described, or the nitric acid may be used in a state of very weak solution as the common drink. We have never seen any very marked advantage derived from the nitric acid pushed to its utmost extent in abscess of the liver; but in the form of a common drink we consider it beneficial, as being gently tonic and refrigerant, and particularly grateful to the patients, especially when it is found not to disorder the bowels, or add to whatever derangement may be existing in them at the time. It may be also used in combination with tonic infusions.

As the abscess advances externally, the tumefaction is changed to a more

distinct tumour, which is generally softest at its apex, with an expanded and somewhat hardened base. If adhesions have formed, some degree of livid redness is generally remarked; but when the abscess is formed in the concave surface of the liver, although there may be general tumefaction observed in the region of the liver, yet a distinct tumour is very seldom present, unless the abscess be seated very near to the anterior edge of the viscus. In those cases where, from the symptoms indicating the existence of abscess, and from the complication with them of certain signs characteristic of disease of an adjoining part, we conclude that the purulent formation is making its way towards some internal organ, little more can be done than to palliate the more urgent symptoms as they arise—moderate febrile action when it becomes at all excessive—support the powers of life, without increasing vascular action—and carry off the morbid secretions, which are apt to accumulate. If, from the presence of thoracic oppression, dyspnœa, anxiety at the præcordia, with a suffocating sensation, cough, hiccup, &c., we have reason to suppose that the abscess is pointing upon, or forming adhesions to, the diaphragm,—antispasmodics, anodynes, and aperients, are requisite; and on some occasions, especially when the presence of pain, the character of the pulse, and state of the patient, seem to indicate the propriety of the practice, the application of leeches over the sternum, or in the direction of the diaphragm, will prove beneficial, especially when followed by fomentations or hot poultices.

If, in consequence of adhesions formed between the walls of the abscess and the diaphragm, and between this latter and the lungs, the abscess empty itself into the bronchia, little else can be done than to palliate the thoracic symptoms attendant upon the disease, and support the strength of the patient. In cases of the above description, we have generally derived much advantage from the exhibition of conium and blue-pill, in the proportion of about two parts of the former to one of the latter; and when the purulent collection has found its way into the lungs, we have generally derived advantage from the nitric acid in combination with laudanum, hyoscyamus, or conium. When the tongue remains moist, the expectoration copious, easy, and purulent, and the patient complains of little or no pain, and the pulse is devoid of hardness

or sharpness, we have also given the decoction of cinchona, with the acid and the narcotics. During the time that this practice is continued, an aperient draught must be given, with the view of keeping up a gentle action upon the bowels. For this purpose, the bitter aperient mixture, frequently mentioned in the course of the Volume, may be given, either at night or early in the morning. If the patient's strength begins to fail, and if there be night perspirations, and loss of that degree of appetite requisite to support the powers of the system, the tonic decoction, with the acid, as now recommended, should not be omitted; and if, in addition to these symptoms, there be also present signs of general exhaustion, with a weak pulse, a cold, clammy state of the extremities, and cold perspirations, or even a state of the system approaching to this, the decoction of bark should be combined with the spiritus ammoniæ aromaticus, and other warm antispasmodics, in the place of the acid. In cases of this description, particularly when the expectoration is considerable, and no acute or painful symptoms present, the *mistura ferri composita* may be given and, in order to keep the bowels open at the same time, may be combined with the *tinctura aloës composita*; and the aloes and myrrh pill may be taken every night at bed-time, in a dose sufficient to procure a full evacuation in the morning.

When abscess of the liver is apparently pointing upon the stomach, as indicated by some difficulty of swallowing, by vomiting soon after matters are taken into the stomach; by great thirst, irritability of the stomach, or pumping up of its contents; by the patient reclining either upon the back with the shoulders elevated, or upon the left side, &c., little further can be done than to support the energies of the system while we endeavour to palliate the urgent symptoms. With this view we have usually given, when the irritability of the stomach was most urgent, a full dose of calomel with two grains of opium at bed-time, an infusion of calumba with tincture of opium, or the camphorated tincture of opium, and sometimes acids with opiates and antispasmodics; preserving, during the while, a free state of the alvine evacuations, by means of enemata suited to whatever state the bowels may be in at the time.

The diet in the above description of cases requires much attention. It should consist chiefly of farinaceous food, taken in sufficient quantity merely for the wants of the system and the powers of digestion. Tapioca, sago, arrow-root, rice, rice-milk, stale bread, biscuit, bread and milk, bread-pudding, jellies, &c., prepared occasionally with a little wine, according to the circumstances and states of particular cases, furnish the most generally beneficial kind of diet. When a little animal food may be ventured upon, either with a view of supporting the energy of the system, or during convalescence, the lightest kinds of fish and the white-fleshed animals should be selected, but even these should be partaken of only occasionally, and in small quantity.

If abscess of the liver be accompanied with much disorder of the bowels and symptoms of dysentery, — a complication of very frequent occurrence, as may be perceived from the cases already detailed, — the disease presents many difficulties to the practitioner. The bowel complaint is generally occasioned in the first instance by morbid secretions, which excoriate and inflame the mucous surface of the bowels, more particularly those parts of them with which they remain in contact for any considerable time. In these cases, purgatives are necessary to carry off morbid secretions, and anodyne and emollient enemata are often required in order to allay the irritation induced in the large bowels. But whilst these measures are being carried into execution, the original seat of mischief must receive attention. When abscess is already formed, the time for expecting advantage from general and local depletions, from sudorifics, &c., is gone by; nevertheless, if much uneasiness or pain is felt in the region of the liver, or in the abdomen, local depletions may be employed; and if the patient be not very much reduced, they ought never to be neglected when pain is felt in the abdomen and in the course of the colon. The warm bath may be also resorted to, and blisters applied over the seat of uneasiness. In these cases, the application of poultices over the seat of tumefaction in the liver should be persisted in, as answering the double purpose of promoting the external pointing of the abscess, and soothing the existing disorder of the bowels. In these cases also, Dover's powder, given

at bed-time, and ipecacuanha injections, are extremely serviceable. The strength of the patient must be attended to, and the diet regulated in the manner already enjoined, during this formidable complication of the disease.

As soon as the abscess has advanced to that state, in process of pointing externally, which shall offer a fair prospect of advantage from giving an artificial exit to the collected matter, the operation for this purpose should not be delayed. But it ought not to be undertaken precipitately, and before the purulent formation has made its way sufficiently near to the external surface of the organ, or before the part at which it points has formed adhesions to the opposite part of the abdominal paries. The practitioner should also be fully convinced, from the state of the tumour in the hepatic region, and from the history of the case, that abscess actually exists, and that the tumour does not proceed from an excessive accumulation of bile in the gall-bladder.—(See Plate XXI. Fig. 1.)

Either in consequence of obstruction of the common or cystic duct, from whatever cause, or from the speedy resolution of inflammation or congestion of the liver, great accumulations of viscid bile sometimes form in the gall-bladder, and give rise to a tumour of this organ at the margin of the false ribs and towards the epigastrium, which may be, and indeed not infrequently actually is, mistaken for abscess of the liver. Care must be taken to discriminate between this pathological condition and the formation of matter in the liver; for it is evident, that if an operation were attempted for the removal of the former condition of disease, death would be the consequence. The accumulation of bile in the gall-bladder, when supervening to congestions of the liver, is often followed, as the formation of matter frequently is, with a remission of the more acute symptoms, and with slight chills: hence the one is more readily mistaken for the other. In the case of abscess, however, the diffused tumefaction preceding the formation of a distinct tumour, with pulsating pain in the region of the liver; the sensation of sinking, with anxiety and oppression; the night sweats, and clammy state of the surface; and the frequent formications or rigors, are generally, of themselves, distinctive of the suppurative process. In the case of great accumulation of bile in

the gall-bladder, the tumour is circumscribed, not preceded by a diffused tumefaction, and is equally soft at its base as at its apex. On the contrary, the tumour proceeding from abscess is at first large and diffused, becoming more circumscribed in its progress, and presenting softness or fluctuation at its apex only, whilst the base is harder and more elevated. These points being duly considered, the existence or the non-existence of abscess may be satisfactorily determined.

Of the external Pointing, and the Operation of opening Abscess of the Liver.— It is often a point of considerable importance to ascertain the direction in which abscess of the liver is likely to point, after its existence has been inferred to the satisfaction of the practitioner; but this is not always an easy matter, and, during its early stages, is more frequently one of supposition than of certainty, unless when it evinces signs of pointing externally. When the abscess proceeds externally, the pain, fulness, and distension in the right hypochondrium and epigastrium, complained of previous to the commencement of the suppurative process, for a time increase, and afterwards diminish very considerably, leaving, in the place of the diffused fulness and soreness, a tumour, which becomes more and more circumscribed. When the abscess advances beneath the false ribs, or near the epigastric region, it is generally sufficiently perceptible; but when it points higher up, or more posteriorly, so as to come beneath the ribs, then a bulging out of the hypochondrium is merely remarked, with fulness of the intercostal spaces, and pain and soreness limited almost entirely to one small spot. In the great majority of abscesses, the direction is to the superior and exterior surface of the liver, and hence their communication so frequently with the diaphragm and lungs, when they fail of pointing more externally. But even in such cases, adhesions to the peritoneum opposite to the seat of abscess are not always formed; for the abscess may advance to the very serous surface of the viscus without coagulable lymph being effused upon this surface in a degree sufficient to attach it to the adjoining parietes of the abdomen. When this is the case, although a circumscribed tumour may point outwardly, yet there will seldom be much redness of its external surface,—an appearance which always indicates that adhesions have formed, or are far advanced in the process

of formation ; and when this is observed, with diminution of the surrounding fulness which accompanied the formation of abscess, and with fluctuation of matter in the tumour, then the operation may be undertaken with every prospect of success. But it ought never to be undertaken too early, or before these signs of maturity are present, for reasons which we shall soon have occasion fully to state.

In many cases, nearly the whole right lobe is one immense abscess ; yet there may not be much destruction of the internal structure of the organ, it being impacted around the parietes of the purulent collection.* In some cases, however, it is otherwise ; and along with great inflammation of the substance of the organ, there is also much softening, and a breaking down of the tissue amid the purulent matter, as may be seen in Plate II. In this latter case, it is by no means likely that an operation, performed with a view of allowing the escape of the collected matter, would prove beneficial ; but in the former, the removal of the contained matter furnishes a rational ground for expecting relief.

When the liver is considerably enlarged in the early stage of inflammation of its internal texture, the formation of abscess is often with difficulty prevented ; and when it is felt below the ribs, with general fulness over the hypochondriac and epigastric regions, the constitutional symptoms already detailed being also present, we may consider that suppuration is going forward, although abscess has not actually arrived at its height. But as long as there are tension, hardness, and tumefaction in the region of the liver, we may be assured that the suppurative process is not yet complete. As soon, however, as the abscess is completely formed, the pain and general tumefaction are diminished ; the liver, in some cases, seems to shrink into its natural position, leaving merely a more or less distinct tumour near the centre of the general tumefaction, when the abscess points externally, unless the purulent collection be so extensive as to fill the greater part of the abdomen, as observed in the cases of Hand, Morris, and several others.

* See Plate VI.

As long, therefore, as there are pain and tenderness felt in the region of the liver, with an undefined tumefaction, and neither a circumscribed nor soft fluctuating tumour is yet formed, an operation undertaken with the view of giving exit to the purulent matter would be premature. But when the pain and general fulness are diminished and replaced by a distinct tumour, without acute pain, soft and fluctuating at its apex, or with a soft elasticity and slight lividity or redness of the surface, and a somewhat hardened and elevated base, indicating that the purulent matter has found its way to the external covering of the liver at the tumid part, and that the liver has there formed adhesions to the opposite part of the abdominal parietes,—the operation may be undertaken with every expectation of success. If it were performed during the former condition of disease, the operator would have to cut deep into the substance of the organ before the purulent collection could be reached, and would run the risk of almost immediately destroying the patient from the hæmorrhage consequent upon cutting deep into so vascular an organ as the liver is, with the additional hazard of finding no adhesions formed between the side and the seat of disease. This is a point of great importance in practice, and should be most particularly attended to, as a mistake of the kind now alluded to would prove fatal. We have seen several instances where premature operations would have been attempted had they not been prevented, and we fear that others have been actually performed. The practitioner should also endeavour to satisfy his mind that adhesions have formed between the surface of the diseased organ and the opposite part of the abdominal parietes, before he attempts the operation. For if the abscess be cut into, and the purulent matter evacuated, whilst no adhesions exist, the liver, collapsing after the evacuation of the contained matter, would recede from the opening made in the abdominal parietes, and the discharge from the abscess would be effused in the peritoneal cavity.

Being satisfied that the abscess is sufficiently advanced for the performance of the operation, and that it has adhered to the external wall of the abdomen, from the distinct character of the tumour, from its soft, elastic, and fluctuating apex, and its sometimes hardened and somewhat elevated base, and from the inflamed or livid appearance of its surface, the surgeon should not

hesitate in the performance of the operation. We do not recommend it, however, to be attempted by means of the trocar, as is usually done; and for the following reason:—The pus which is formed in abscess of the liver is often full of large flakes, and sometimes contains large coagulated clots of a cheese or curd-like matter, which will not pass through the largest trocar, the more fluid portions only coming away. These clots remain, acting as foreign substances in promoting continued suppuration of the organ, and febrile excitement of the system. We, therefore, have been always in the habit of performing the operation without the trocar, and in the following manner:—having made the external incision large, and with caution, until the peritoneum is fully exposed, the fluctuation of the abscess will be distinctly felt. An abscess-lancet should then be introduced, and the tumour laid open to the full extent of the external wound, which ought to be from two and a half to three inches in length. Care should always be taken that the opening extend not beyond the limits of the adhesions which have been formed. The purulent collection being fully evacuated, the cavity should be filled with lint, which gives a mechanical support to the excavated parts, and the wound dressed with compresses and bandages in the usual way.

The treatment, after the operation, will depend necessarily upon the circumstances of the case. The wound must be dressed as before, from time to time—at least once or twice daily, the collected matter allowed to escape, and compresses and bandages properly applied. After two or three days the discharge will be diminished, when the quantity of lint introduced into the cavity may be lessened, and in a few days entirely omitted, the external incisions only being kept open, and compresses and bandages applied, until the discharge entirely ceases. The bowels should be gently acted upon, so that morbid secretions and fæcal accumulations may be carried off, and the strength of the patient kept up under the disease by means of a light, nutritious, and chiefly farinaceous diet, taken in moderate quantity. If the powers of the system seem to require tonics, they should be given, and varied according to the circumstances of individual cases. The compound infusion of gentian, the infusion of calumba, the cold infusion or the decoction of bark, with astringents, stimulants, antispasmodics, &c., such as the mineral acids, the

spiritus ammoniæ aromaticus, the spiritus ætheris nitricus, the tinctura camphoræ composita, and any of the tonic or cardiac tinctures which the peculiarities of the case may require. Sometimes it will be necessary to allow the patient a few glasses of wine through the day: when this is required, the particular kind of wine must be selected according to the habits and inclinations of the patient, and the symptoms present.

When abscess of the liver finds its way into an adjoining viscus, as the colon, stomach, lungs, &c., the treatment must be regulated according to the principles already inculcated. The most urgent symptoms should be allayed by medicines suited to their nature, and the energies of the digestive organs kept up or promoted, as circumstances may require. If the powers of life begin to flag they must be rallied, and morbid accumulations in the bowels should be carried off by means of aperients combined with tonics, and by appropriate enemata.

The following cases, illustrating both successful and unsuccessful operations for abscess of the liver, and the treatment where abscess had found its way into adjoining viscera, will further explain our views upon this important subject.

CASE CXXII. — *Abscess of the Liver.* — *Operation.* — *Recovery.*

CAPTAIN N——, of the Madras army, was attacked early in December 1817, in camp on the Narbuddah, with an acute inflammation in the liver, for which he was very boldly and decidedly treated. The army were actively employed at this time in Malwah, and we had not many opportunities of visiting him; but we did occasionally see him, and fully concurred in the views and mode of treatment adopted by his medical adviser at the time, Mr. H. Jones, a very able practitioner. In defiance, however, of every effort to prevent the formation of matter, a very large abscess formed, and pointed a little below the margin of the ribs, on the right side. Early in February the abscess became sufficiently prominent, with evident fluctuation and adhesions to the parietes of the abdomen, and an operation was determined upon, in which we were assisted by Mr. Jones. An incision was made, two inches and a half or three inches in length, through the most depending part of the tumour, and carried carefully down to the peritoneum, which was also dissected through till the abscess was distinctly

visible, when an abscess-lancet was introduced, and the tumour was laid open to the full extent of the external wound. About a quart of pus was discharged, full of those flaky, ropy clots of pus which we have frequently found on examining similar cases of the disease in the dead subject. The empty space was completely filled with lint, the wound dressed with compresses and bandages, and there was much less exhaustion than we had often seen before, when much less discharge had come away. The dressings were removed morning and evening. The discharge was free and copious. He had no fever after the operation, but improved daily; and although the weather was very hot, and the army marching daily through jungly and unwholesome countries, namely, the Narbuddah and Sindwah jungles, and Candeish, there was none of those bad symptoms after the operation, which we have invariably seen when the trocar was used, and he progressively recovered. He did not, however, perfectly regain his strength till he took a sea voyage, and remained a few months at the Cape of Good Hope, after which he returned to his duty in India, and is now a healthy man. The treatment, after the operation, consisted of gentle tonics and aperients, directed with the view of supporting his strength and restoring the healthy functions of the abdominal viscera.

CASE CXXIII. — *Large Abscess of the Liver. — Operation. — Recovery.*

AN European woman, about 25 years of age, wife of a soldier in His Majesty's 46th Regiment of Foot, came into the General Hospital at Madras in August 1819, with a very large tumour in the right side, extending considerably below the ribs, and across the epigastric region to the left side. There could be no doubt of the liver being the seat of disease; but abscess, though evidently forming, had not arrived at its maturity. The region of the liver was hard and painful to the touch, and there were considerable tumefaction and heat of skin; irritative fever; foul tongue; full, quick pulse; bowels constipated, and considerable dyspnœa and oppression at the præcordia. Fomentations and poulticing, aperients, saline mixture, &c. &c. were used for ten or twelve days, when the tumefaction subsided very considerably, and an evident fluctuation was discovered below the præcordia, and near the margin of the ribs, which appeared to point in this direction, but not sufficiently to authorise an operation. These appearances were encouraged by the same remedies for some days longer; and although it did not point so distinctly as in Captain N——'s case, yet, as the abscess was evidently matured, of which we judged from the subsiding of the general tumefaction, and the evident tumour and fluctuation, which, although obscure,

from its being deeply situated, could not well be mistaken. We determined, therefore, on the operation, and, in presence of the surgeon of the regiment, assistant-surgeons, and some medical men of the Presidency, we made an incision through the integuments over the centre of the soft tumour, which we found exceedingly thick, with much adipous matter underneath, and which accounted for the obscure feel of fluctuation. From the external surface to the peritoneum the wound was at least three inches and a half deep. On laying the peritoneum bare, we found the abscess distinctly pointing: an abscess-lancet was introduced, and the opening enlarged to the full extent of the external wound; nearly two quarts of green, watery fluid came away, with thick, flaky, and ropy matter. The cavity was filled with lint, and dressed in the usual way, with a large poultice over the whole. She was much relieved from oppression; her spirits were good; and in the evening she was as well as could be expected. The discharge was very copious, and consisted of coloured matter similar to what was removed by the operation. An anodyne was given at bed-time. The wound was dressed in the same manner, that is, filling the cavity with lint; and in two or three days the pus became more healthy, of a white colour, but still ropy and flaky. In a week the discharge diminished much, and considerably less lint was required for dressing; and in sixteen days the dressings were simple, the discharge trifling, and the strength improving. In six weeks she was perfectly well, and enjoyed good health while she remained in the garrison. The regiment to which her husband belonged left Madras, about eight months afterwards, and she accompanied him, in perfect health.

CASE CXXIV.—*Abscess opening into the Lungs. — Operation. — Remarks. —*
Mr. Richardson: his eminent services. — Death.

CAPTAIN E——, of the Madras army, arrived at Madras from the Northern Circars, on the 15th March, 1823. Captain E—— was a correct observer; and, as he brought no statement from his medical adviser, we give his own account of his case:—Has been ill since January with an affection of the liver, and had been treated by some of his medical friends at Masulepatam; but not deriving any material advantage, they advised him to go by sea to Madras. The vessel, instead of taking him to Madras, carried him up the coast to Vizagapatam, and he was actually at sea twenty-seven days before he reached Madras. He had been very uncomfortable on board the vessel; and the night previous to his landing (14th March) he expectorated a very large quantity of pus and mucus combined.

When we saw him he was exceedingly reduced in strength and bent forwards,

complaining of a very heavy weight in his side; and there was a visible enlargement of the liver, extending through the whole hypochondriac and epigastric regions. From the quantity of pus and bloody mucus expectorated, it was evident that an abscess had broke in upon the lungs. His skin was dry and parched; and, although there was evidently abscess in the liver, there was no pointing to justify any operation; nor did it appear that there were any adhesions formed between the abscess and the abdominal parietes. We endeavoured, therefore, to support his strength, and to assist nature in the performance of her functions. His diet was of the lightest and most nutritious food — milk, sago, arrow-root, &c. ; and *pilul. hydr. gr. j.*, *pil. aloë. cum myrrh. gr. ij.* were given every night; and a tea-spoonful of castor oil occasionally. The nitro-muriatic lotion was applied to his side, and a large poultice over the whole abdomen, renewed frequently in the day and night. This plan was continued with advantage from the 15th to the 25th. His strength improved, and the tumour diminished in its external appearance; but he felt more internal fulness and more pain than formerly, particularly between the tenth and eleventh ribs; and as in this situation there was evidently an obscure fluctuation,—(but there was no pointing, nor was there any sign whatever of adhesions, which would induce us to cut down upon the abscess),—Mr. Richardson, a very distinguished and most excellent surgeon, thought an operation might be performed with some hopes of advantage. Having always a very great respect for his judgment, a consultation was held on the 28th March, in which it was determined that no advantage could be expected from the operation. This opinion was communicated to the patient; but he was decidedly in favour of an operation, and, indeed, insisted upon its being performed, requiring that, whatever might be the result, it should be attempted. Under these circumstances we performed the operation, with Mr. Richardson's assistance, cutting down between the tenth and eleventh ribs, and dissecting cautiously through the intercostal muscles. The wound was made about three inches in extent; and, on introducing my finger, I found the abscess considerably higher than where we had made the opening, although this appeared to be the most depending part of the tumour. From the wound being large, we were enabled to pass two or three fingers, so as to support the tumour, and with the point of a scalpel we opened it, making our hand the medium of conducting the pus, for we found the abscess pendulous and the adhesions doubtful. A considerable quantity of curdled pus was discharged, to the amount of at least sixteen ounces. The wound was afterwards cautiously filled with lint and dressed, and a large poultice was applied over the wound and hypochondriac region. The patient passed a much better night than usual, and the following

morning the matter flowed freely from the wound, and was thick, flaky, and curdled. His bowels were very costive, but were attended to, and relieved daily. The pulse was quick, but of good volume; appetite tolerably good. From this time he improved; his sleep became more quiet; cough less troublesome; bloody sputa ceased, though the expectoration continued purulent. No change whatever was made in the treatment; he was dressed twice a day. The discharge from the wound diminished; granulations formed; the pulse was frequent, 100 in a minute, but of good strength; tongue became healthy, clean, and natural; and, in order to avoid the hot season, he embarked on the 6th April, on board the *David Scott*, for the Cape of Good Hope, with every prospect of recovery. We have since learned that he had a relapse on board ship, and died, either at sea or at the Cape of Good Hope.

Remarks.—This officer laboured under a constitutional torpor of the bowels, and was obliged, for many years of his life, to take gentle aperients daily. He was so perfectly master of his own habits, that he regulated himself to the greatest nicety; but the least irregularity or neglect was always attended with serious inconvenience. We were in the same regiment with him for many years; and, although he was so liable to disease, he was always alert for duty, and never in the sick report; and this could only be accomplished by that regularity of system which habit had taught him. On his arrival at Madras we received him as an inmate in our own house, where he had every attention, and was visited hourly, either by ourselves or assistants.

The credit of this operation is certainly due to Mr. Richardson, whose science and judgment we have often had reason to admire. The premature death of this truly able surgeon and practitioner, by cholera, has been a public loss. He has left behind him few equals, and certainly no superior. To his zeal and ability the Indian community are indebted for the establishment of the Eye Infirmary at Madras, which was undertaken and carried into effect by him with no common obstacles to encounter. We have his annual reports from 1819 to 1823; and his success may be estimated by the following statement:—

	No. Admitted.	Restored to Sight.	Restored to Partial Sight.	Died.
First year	486	291	80	3
Second year	647	389	200	2
Third year	1334	1032	285	4
Fourth year	827	589	167	1

From this one only of his public services the merits of Mr. Richardson may be estimated. For professional science, general knowledge and ability, and zeal in the

discharge of his public duties, he reflected honour on the service to which he belonged, and on the medical character. For his private virtues, and as a member of society, he was generally and deservedly esteemed. His professional exertions, and the fruits of them, will be long remembered and even felt by many. By ourselves, who have observed them often, and always with pleasure, they will never be forgotten.

CASE CXXV. — *Five distinct Abscesses of the Liver. — Operation. —
Post Mortem Examination.*

LIEUTENANT S—— was attacked with fever while in camp; was sent to Madras for change of air, and applied to us in August 1820. He had no statement of his case, or the treatment that had been adopted; and the only account he gave was, that he had a bad fever in camp, and that he came to Madras on sick certificate. At this time he had no fever, but his bowels were very irregular, and his countenance had that peculiar sallow tinge which marks biliary derangement. There was no uneasiness in his side; the pulse regular and good; tongue foul. The following draughts were ordered:—R Infus. gent. ʒjss.; infus. sennæ, ʒvj.; tinct. cardam. ʒij. M. ft. haust.; one night and morning. This medicine acted gently upon his bowels, and gave two good motions daily. On the 24th of the month he called again, and complained of pain in the lower part of his belly on the left side, midway between the spine, os ilium, and umbilicus; and on examination, an enlargement about the size of half-a-crown was discovered, which appeared to be situated under the skin, and was attributed by him to a strain in jumping; it was painful to the touch, and movable like an enlarged gland. A few leeches were applied, and his medicines were continued, with the following pill every night:—R Pilul. hydr. gr. j.; pilul. aloë. cum myrrh. gr. ij.; syrup. q. s. Ft. pilul. We saw him again on the 27th; pain in the tumour quite removed, but the hardness remained. The medicines were continued, and the tumour rubbed with a little mercurial ointment and camphor. On the 30th, we visited him at his own quarters, according to his request: it appeared he had been attacked the preceding night with febrile symptoms and headach. When we saw him, between twelve and one o'clock, his skin was warm, but not hot or dry; his eye yellow, and tongue foul, covered with a thick, yellow crust; pulse not materially increased in frequency, nor did he complain of pain or uneasiness any where.—ʒij. sulph. magnes. and ʒj. tinct. jalap. were added to his aperient draught, and on the 31st he was considerably better; but during the night he was attacked with a very severe pain in the right side, which he discovered by making a blow at his servant. About

twelve o'clock on the 1st of September the pain had subsided, and he was at that time comparatively easy, but he could not lie upon either side, or take a deep inspiration. The skin was hot; pulse much accelerated; tongue excited, and covered with a white crust; bowels well relieved. — Twenty-two leeches were applied to the side in the evening, and the following pill prescribed:—R Calom. gr. x.; pulv. antim. gr. iij. Ft. pilul. h. s. s. Mist. purg. ℥ij. cras mane sumend. The delay of applying the leeches at an earlier period arose from some doubts of the propriety of bleeding in his weak state, entertained by the patient himself, fearing that debility might be increased by this measure — a mistake too often made.

2d. — Says he found little relief from the leeches, though he admits he is much easier; tongue white and excited; skin hot; pulse frequent; and his bowels have been well opened. — Mist. salin. febrif. every two or three hours. Repet. pilul. calom. h. s., et repet. mist. purg. cum sulph. mag.

3d. — Says he is worse this morning, and the pain more severe, particularly near the spine, where he cannot bear the slightest pressure; pulse 120; skin hot; tongue much loaded; stools green, and mixed with viscid mucus. A similar consideration to that already noticed interrupted the application of leeches again, which appeared to us so very necessary. They were, however, deferred, till a consultation in the evening authorised their application; but the patient would not himself allow more than ten to be applied, nor could he be prevailed upon to permit the application of more during the night, though he was most urgently solicited to do so; neither would he take any medicines.

4th. — Pulse 120; tongue much excited, but moist, and not so much loaded as it was; says he feels easier this morning; but he cannot take a deep inspiration, nor can he lay upon either side; pain is not so sharp when pressure is made over the right hypochondriac region, but he complains of a very sharp pain when the slightest pressure is made under the false ribs near the spine, and there is considerably more heat in that part than in any other part of the body. His bowels are free; motions rather watery and green, with some mucous and undigested matter. Twenty leeches were immediately applied to the part most painful near the spine.* Mist. salin. febrif. every two hours.

Half-past Five o'Clock, P.M. — The leeches have bled well; skin cool; pulse small;

* It is much to be lamented that any objections should have been raised to the application of leeches at that early period, when they were calculated to be so useful. Fifteen hours were lost before they were applied; and in this stage of disease the loss of fifteen hours cannot be recovered.

pain continues, but is not so severe; he now complains of pain under the fifth and sixth ribs, which darts through him; he breathes with more freedom. — Repet. calom. h. s. s. R Mist. camph. ℥jss.; elix. paregor. ℥ss.; aquæ ammon. ℥xx.; spirit. æther. nitros. ℥xxx. M. ft. haust. h. s. s.

5th. — *Eight o'Clock*, A. M. — Passed an excellent night; the pain is considerably diminished, and he can lie down without any inconvenience; still feels a stinging pain between the fifth and sixth ribs, extending to his shoulder; the pill has not had any effect; tongue less excited, and moist; pulse small, quick, 112; skin cool; he thinks himself better. — R Calom. gr. jv.; pulv. antim. gr. iij. Ft. pilul.; to be taken three times a day. Apply a large poultice over the whole hypochondriac region, with a small quantity of unguent. mercur. cum camph. spread over it; and let the side and chest be occasionally fomented. Repet. mist. salin.

Evening. — Pain in the posterior part of the liver considerably better; bowels have been moved; motions a very dark-brown colour, and exceedingly offensive; on raising himself suddenly from his cot he felt a good deal of pain, and the sensation as if something had suddenly given way in the right iliac region, and had a motion immediately, which I examined, and found morbid and feculent green-coloured matter, but no pus; he now feels a very sharp pain between the fourth and fifth ribs, which interrupts his breathing; pulse 120, hard; skin hot. — Apply ten leeches immediately to the side, and nine to the right iliac region. No sickness; no cold sweats; no rigors. — Haust. anodyn. h. s. s. Cont. ut antea.

6th. — Passed an excellent night, and is much easier; has been well purged; stools dark green, with some dark-brown, feculent matter, lumps of hardened fæces and undigested food; pulse 120, full and soft; tongue excited, thirst urgent; skin warm, dry, with a greasy feel; mouth not at all affected; feels the heat of the weather very much. — Cont. omnia.

7th. — Passed a good night; bowels well opened; motions watery and brown, with glairy mucus; pulse 120; says the pain is less. There is every appearance of suppuration in the liver going on, but he has never had any cold sweats, rigors, or sickness at stomach; he has continued his medicines regularly, and feels no effect from them upon his mouth. — Discontinue the pills. Cont. salin. mist., poultice, &c. &c., and attend to his diet. Arrow-root, sago, milk, &c. &c.

Evening. — A considerable tumefaction has made its appearance over the præcordia, not painful on pressure; his tongue is rather dry. — Cont. poulticing, fomentation, &c. &c.

8th. — Passed an indifferent night; does not complain of pain any where but in the

right iliac region, and this is not a fixed pain; his teeth are dry, and the tongue is clammy, but moist; urine not high-coloured; pulse 120, and irritable; skin hot and greasy; he complains for the first time of very great weakness. We have no doubt that an abscess either is forming or has formed, and all we can now do is to support his strength. — Cont. poulticing.

Evening. — For the first time we have observed something like a cold perspiration; pulse 118, very small and irritable; complains of great debility; the fulness in the epigastric region is much increased, and the liver is evidently enlarged with a hard circumscribed tumour, not larger than the hand. — Cont. Give a little wine in his arrow-root.

9th. — The tumour is very much increased in size since yesterday, it extends to the umbilicus; he has cold perspirations, but neither rigors nor sickness. — Cont. fomentations, poulticing, and nourishment; the bowels are regulated with enemata.

10th. — Cont. — 11th. He awoke this morning with a dry, parched tongue, for the first time; although excited and loaded, it has always been moist; he is becoming weaker, and, though there cannot be a doubt as to the formation of the abscess, yet it does not appear to point externally, and the tumour is very hard; his breathing is very much oppressed. If the abscess would point, the operation might be performed, though we much fear the result. — Cont.

12th. — The tumour continues hard, and there is no redness on the surface indicative of adhesions between the side and liver. — Cont.

13th. — Tongue very dry, smooth, and brown, which has some effect upon his voice; the tumour has become much softer to the touch, and there is an evident fluctuation; the oppression in his chest is very great, and he cannot rest or sleep, in consequence of which he wishes to be relieved by the operation, though we fear there is little hope of success.

The operation was accordingly performed, and upwards of lbj. of thick white pus discharged. His breathing was relieved at once; the pulse came down to 108, was firm, and he had a little sleep; but this was of short duration. He died about five or six hours after the operation.

On examining the seat of disease, we found five large, distinct abscesses in the right lobe of the liver. The greatest part of the convex surface of the right lobe formed two distinct abscesses — namely, the one which we opened, and another adjoining, separated only by a small membranous septum. The third abscess was in the posterior portion, adhering to the ribs near the spine, and communicating, by a very small opening, with the abscess which was opened. The fourth was perfectly distinct,

and in the superior convex surface, adhering closely to the diaphragm; and the fifth at the inferior margin of the right lobe, and adhering to the cæcum and head of the colon. The left lobe was sound, and all the other viscera seemed healthy.

CASE CXXVI. — *Acute Hepatitis; Abscess in the Left and Right Lobes.—Operation.—Post Mortem Examination.*

JOHN GAMBEL, ætat. 23, 46th Regiment, admitted from the regimental into the Madras Hospital. Has pain in his right hypochondrium, very acute on pressure; some cough; skin hot and dry; pulse quick, but not full; considerable fulness over the epigastrium; bowels open, and stools of a yellow colour. Complaints of ten days' standing.—Appl. hirud. xx. statim hepatis regioni. R Hydr. submur. gr. xx.; opii puri, gr. ij. M.; h. s. s.

July 1st, 1820. — Still easier since the leeches were applied; pulse rather quick and full; skin natural; tongue furred; great thirst; appetite very good. — Sumat pulv. aperien. statim. Repet. hirud. xx. ut heri. R Mist. salin. comp. ℥jss. tertiâ quâque horâ. Sumat calom. ℥j. cum opii, gr. ij. h. s.

2d. — Passed a good night, and says he feels a great deal better; tongue excited; pulse small; skin of a natural heat, but covered with a clammy sweat; well purged yesterday evening, but no stool during the night. — Repet. haust. purg. Cont. alia. Appl. catapl. cum ung. hydr. hepatis regioni et regioni epigastricæ. Sago and wine.

Vespere. — Purged freely; side easier; otherwise as at last report, with the exception of having some difficulty in voiding his urine. — Cont. med. R Decoct. oryzæ, ℥ij.; potass. nitros. ʒj. M. ft. potu ad libitum.

3d. — Says he feels more pain in his side this morning; skin warm; pulse firm; tongue pretty clean; no difficulty in passing his urine this morning. — Appl. hirud. xij. parti dolenti; post. cont. catapl. R Pilul. aloë. cum calom. no. 1. ter die. Mist. amar. cum sennâ, ℥iij. h. s.

Vespere. — Skin hot and dry, with a quick pulse; tongue moist; stools of a yellow colour, but tenacious and copious, and passed without any straining; says he feels considerable pain about the epigastrium; no headach; great thirst. — Cont. med. et appl. hirud. xv. reg. epigastric.; post. cont. catapl. Habeat baln. tepidum statim, necnon enema purg.

4th. — Pain complained of relieved; pulse 100, full, with a degree of sharpness; tongue white; purged in the night often; his stools were copious; thirst urgent. — V. S. ad ʒxx. Cont. alia, ut olim.

Vespere.—The first $\bar{\text{z}}\text{xvj.}$ of blood are cupped, with a slight appearance of buff, but none on the last $\bar{\text{z}}\text{iv.}$; his pulse became perfectly calm and natural after the bleeding, and continues the same; tongue less excited. Cont. med. et catapl.

5th.—Considerable fulness in the epigastrium; in fact a complete tumour is formed since last evening, and the pain is very acute on slight pressure being made, or when he is on his back; has had no cold sweats nor rigors at any time since his illness, but he feels very weak and giddy when he gets up to the stool; skin at present warm, but moist; tongue white and excited; thirst urgent; pulse 98, and full, not hard or sharp; no pain in either shoulder; some cough; five or six stools in the night, which were loose; countenance very sallow; urine of a natural colour.—Fotus regioni epigastricæ, et appl. catapl. cum unguent. hydrarg. ter die, ut antea. Pilul. omit. R Mist. salin. comp. $\bar{\text{z}}\text{jss.}$ tertiâ quâque horâ. Sago and wine. R Potu acid. nitros. ad libitum.

Vespere.—The tumour is very painful at night, and is much increased; five stools from the enema, of a dark colour; tongue moist and clean; pulse 100, and soft; skin warm, but moist; thirst troublesome; says he had a very cold sweat upon him about four o'clock this morning.—R Decoct. cinch. $\bar{\text{z}}\text{ij.}$; acid. sulph. dilut. mxx. M. ft. haust. ter die sumend. Cont. fotus, catapl., et potu acid. nitros. Sago diet, and two glasses of wine. Some fowl.

10th.—The tumour of the scrobiculus cordis somewhat increased, and the pain is very severe; respiration hurried and rather impeded; pulse calm; skin perfectly natural; tongue clean; takes his diet pretty well; has had no stool since morning; passed a very good night after the draught.—Cont. omnia. Repet. haust. anodyn. Vin. $\bar{\text{z}}\text{iiij.}$ in die.

13th.—The tumour is pretty easy from one o'clock this morning, but the pain has returned; it is somewhat increased in size, and confined chiefly to the left lobe, but there is considerable swelling all down the left side to the ilium, and he feels no pain, only immediately at the tumour; some oppression in his breathing; no cold sweats; pulse 100, and soft; skin natural; tongue moist and clean; great thirst; alvine evacuations copious, of a dark colour, like clay, but not particularly offensive; takes his nourishment pretty well.—Cont. med. et vin. $\bar{\text{z}}\text{iv.}$ Habeat enema purg. statim. R Pilul. alter. bis die.

But little alteration of the symptoms or treatment occurred till the 22d, when he passed a very restless night; pulse rather quick, but firm and soft; skin cool and moist; tongue clean and moist; stools of a brown colour, frequent and offensive; the tumour is very large and painful (about nine inches in circumference); the abscess

presents itself near the ensiform cartilage, rather to its left side, and it is expedient to open it as soon as possible.

Operation.—An incision made in the direction of the right rectus, for the space of above two inches, discovered the sheath, which was cut down upon and divided by three or four light incisions, lest the sac should be opened by the knife gliding through parts so tense, when the round and perfectly resisting sac of the abscess was felt. This was then perforated by an abscess-lancet for the space of an inch and a half, when the matter came forth with much force, to the quantity of two pounds and a half. Its consistence and appearance were at first green, watery, with flakes of pus; afterwards that of healthy pus, streaked with a little blood, and intermixed with a quantity of green bile. During the exit of the matter, a little wine and water was given. Slight pressure was applied to the abdomen by the hand. The cavity was filled, and the orifice kept open by lint, and supported by sticking plaster, over which a compress and bandage were applied, and the patient felt considerably relieved.

Pulse, after the operation, was very good; skin natural; tongue clean and moist.—Cont. decoct. cinchon. cum acid. ter die, ut antea. Vin. $\mathfrak{h}\mathfrak{j}$. in die. Cont. pilul.

Vespere.—Passed the day pretty well; stools quite light; skin of a natural heat; pulse 126, and soft; tongue somewhat white, furred, and dry; had an hour's sleep on his back; took his nourishment pretty well.—Cont. omnia. R Tinct. opii, $\mathfrak{m}\mathfrak{x}\mathfrak{l}$.; spirit. æther. nitros. $\mathfrak{z}\mathfrak{ss}$.; vin. antim. $\mathfrak{m}\mathfrak{x}\mathfrak{x}$.; mist. camph. $\mathfrak{z}\mathfrak{ss}$.; aquæ puræ, $\mathfrak{z}\mathfrak{j}$. M. ft. haust. h. s. s.

Eight o'Clock, A.M.—About twenty ounces of yellow serum were discharged, intermixed with flakes of good pus, and green watery bile; the orifice looks very well, and he feels easy; tumour has quite disappeared; pulse 134, and soft; tongue rather foul; he is in good spirits.—Cont. decoct. cinchon. cum acid. ter die, et vin. $\mathfrak{z}\mathfrak{v}\mathfrak{i}\mathfrak{i}\mathfrak{j}$. Capiat mist. salin. compos. tertiâ quâque horâ, sine vin. antim.

Vespere, Five o'Clock.—One or two stools, perfectly white, rather feculent; was several times at stool, but could pass very little; tongue moist this evening, and cleaner; pulse small and frequent; heat natural; side easy; respiration natural; eyes rather yellow.—Habeat enema purg. $\mathfrak{z}\mathfrak{v}\mathfrak{i}\mathfrak{i}\mathfrak{j}$. quàm primùm. Cont. vin. et mist. salin. ut antea.

Nocte. Dressed.—The first ounce of discharge was yellow serum after the lint was withdrawn from the orifice, after which about two ounces and a half of pretty good pus came away; a good deal of the former had oozed out over the compress and bandage; says he feels very easy, and inclined to sleep; pulse pretty firm; skin cool.—Anodyne taken.—Cont. alia.

23d. — Discharge from the orifice as before; stools without any appearance of bile; says he feels very easy; tongue rather dry; free from fever; pulse 114; took his diet. — Cont. omnia.

24th. — The orifice looks very well, the tumefaction considerably subsided, and his belly is quite soft; the discharge is pretty copious, but the whole is over the dressings, and very little pus is discharged after the lint is withdrawn; voided the enema, with some clay-coloured, feculent matter, and a middle-sized lumbricus. — Repet. enema purg. bis die. Cont. alia. Vin. \bar{z} viii.

25th. — Passed a pretty good night, but he appears very weak this morning, with some degree of coldness of the skin; pulse 130, small, but pretty firm; says he feels very easy; tongue clean and moist; stools as yesterday; the dressings are soaked in serum from the abscess, of the same dark-yellow and green appearance; a little good pus was discharged, intermixed with some dark and extremely offensive matter, after the lint was withdrawn; the orifice is rather irritable; he has some tendency to delirium. — Cont. haust. cinchon. et vinum, ut antea. Dressed as before. Repet. enema purgans bis die.

Eight o'Clock, P.M. Dressed. — The compress and bandage are soaked as before in bilious matter; after withdrawing the lint, about two ounces of pretty good pus were discharged, with some coagulated blood; is troubled with hiccup; pulse firmer, and his skin is not so cold; tongue slightly dry in the centre, but clean and moist at the edges. — Repet. haust. anodyn. h. s.

From this time he sank, became delirious, and died at 2 P.M. of the 27th.

Examination, three hours after Death. — The whole of the left lobe of the liver, and a considerable portion of the right, formed a complete sac for the abscess. The gall-bladder completely adhered to the walls of the abscess, and communicated with it. The ducts were impervious, being involved in the adhesive inflammation of the parts forming the parietes of the abscess; and the bile secreted by the liver was either retained in the abscess, or was discharged by the wound. The part of the liver which was not involved in the suppurative process, was in a high state of congestion, and full of dark, black blood. There was no other appearance of disease in any of the viscera.

Remarks. — Abscess was evidently commencing about the time of his admission under our care; or, at least, disease was too far advanced to prevent its supervention. The occlusion of the gall-ducts, and communication of the abscess with the gall-bladder, were evidently the consequence of the extension of disease, subsequent to the early stages of the purulent formation. The appearance of bile in the discharge readily

suggested what the dissection disclosed, and gave us no hopes of the patient's recovery.

The following cases illustrate the progress and phenomena of abscess of the liver when it opens into any of the contiguous viscera, and will convey some idea of the practice which may be adopted in order to conduct them to a successful termination. They are abridged from the hospital diaries, without any important omission, and admit of no remarks after what we have already advanced in the present section respecting this subject.

CASE CXXVII. — *Hepatitis; Insidious Abscess, breaking into the Bowels.* —
Perfect Recovery.

JAMES MILWOOD, private, Madras European Regiment, recently arrived from Europe, was admitted into hospital the 20th December, 1812, at Vellore, complaining of headach, fever, and a deranged state of the alimentary canal, and morbid and acrid accumulations in the bowels. He was well purged with calomel and the purging mixture, with the best effects, and on the 2d January, 1813, he was discharged.

On the 2d January the regiment marched from Vellore for Wallajahbad, where it arrived on the 7th; and on the 10th Milwood was re-admitted into the hospital; he is a slovenly, heavy-looking young man, about 22 years of age, and has been feasting upon unripe fruits and country sweetmeats; and although he denies the fact, we have no doubt he has been drinking fermented toddy.

Seven o'Clock, P.M. — Complains of fulness at the pit of the stomach and over the whole abdomen, as if the bowels were distended with flatus; considerable pain, great uneasiness, and general anxiety. — R Spirit. æther. vitriol. ℥j.; tinct. opii camph. ℥ss.; aquæ puræ, ℥j. M. ft. haust. stat. sumend. Apply fomentations over the abdomen. Administer a terebinthinate enema, and apply a large blister over the whole stomach.

Nine o'Clock, P.M. — Feels rather better, but still much distressed. — R Aquæ ammon. ℥xxx.; aquæ puræ, ℥j. M. ft. haust. Three of these were repeated before 12 o'clock, when he was much relieved. Apply twenty leeches over the belly.

11th. — Feels much better this morning, but he still complains of soreness and heat in his bowels; motions yellow and frothy, not watery; tongue dry, and he complains of great thirst; pulse full and rather hard; the leeches have bled very well, and the blister has performed its duty. — R Sulph. magnes. ℥ss.; aquæ puræ, ℥bj. M. ft. haust. Enema terebinth.; and let him drink congee water, with tamarinds.

Evening. — The enema operated very well; the tension in his belly is much relieved, and he feels much easier; but he still complains of thirst, dry tongue, and soreness over the belly; has been purged frequently, and has passed watery motions, with pieces of undigested food. — Calom. gr. x. h. s. s. Cont. enema.

12th. — Feels much better this morning; the tension of the belly is much diminished; cough less; not so much heat or pain in the abdomen; pulse soft, full, and natural; tongue cleaner; stools consist of lumps of white matter, like curdled milk. — Repet. haust. purg. Repet. calom. gr. x. h. s. s.

13th. — The pain and heat in his belly are removed; his thirst is much diminished; stools a clay colour, and very copious: while speaking to him he was seized with giddiness in his head, and there appears great heaviness about his eyes. — Apply a blister to the nape of the neck. Pulv. purg. stat.

14th. — Has been fully purged and feels much better; the blister has risen well, and the giddiness is relieved; pulse good. — No med.

15th. — Had no stool yesterday, and feels rather uneasy in his bowels in consequence; but in all other respects he is better. — Pulv. purg. stat.

Evening. — Purged frequently and feels relieved. — R Pilul. hydr. gr. v. nocte manequ.

16th. — Feels no pain; head much relieved; had frequent stools in the night. — Cont. pilul. hydr.

17th. — Feels quite well this morning; has been purged. — Haust. purg. fbj .

18th. — Says he has no complaint but the pain from the blister.

19th. — Felt some giddiness this morning, but no other alteration. — Pulv. purg.

Evening. — Felt something break, about 3 o'clock, P.M., immediately under the umbilicus, and discharged a quantity of thick matter like cream; he felt immediate ease, and has continued to feel easy; he is much troubled with flatus, and the belly feels tense. — Apply a flannel bandage around his abdomen. — R Sulph. magnes. ʒss .; aq. menth. pip. ʒx . M. ft. haust.

This had no effect at 11 o'clock, P.M. and ʒiij . ol. ricin. were given.

20th. — Stools very copious and like quicklime and water mixed. — Haust. purg. ʒx . Pilul. hydr. gr. v. h. s. s.

21st. — Feels very weak; stools like lime and water, with some flaky lumps of matter mixed with them. Cont. pilul. et haust. purg. — 22d. Cont.

23d. — Stools this morning of a pale, light-green colour. — Cont. pilul. hydr.

24th. — Stools white this morning. — Cont.

25th, 26th, 27th, and 28th. — No alteration of any consequence. — Cont. pilul.

29th. — Had no stool in the night, and feels pain in the belly. — Ol. ricin. \mathfrak{z} ij. stat.

30th. — Purged very often by the oil; stools clay colour; he feels easy. — Cont. pilul. hydr.

31st. — No stool yesterday. — Haust. purg. \mathfrak{z} x.

February 1st. — Stools pale coloured, like lime and water, and amazingly copious. — Cont. pilul. hydr. ut antea.

2d. — Precisely the same; we imagine that an abscess must have formed and given way, and that the motions are coloured by the discharge of the matter into some part of the bowels, as the stools were never of the same appearance before he felt the sensation of something breaking, and since that period they have never varied; he is certainly very much better, and is gaining ground. — Cont. pilul. hydr. R Pulv. rhæi, gr. viij.; ferri. vitriol. gr. ij. M. ft. pulv.; to be taken every day at twelve o'clock.

3d. — Cont. — 4th. Had no stool yesterday. — Repet. haust. purg. \mathfrak{z} x. This was repeated in four hours without any effect. — *Eight o'Clock*, P.M. — Pulv. purg.

5th. — Was largely purged during the night; stools, for the first time, are assuming their natural colour. — Cont.

6th. — Had no motion in the course of yesterday night, and took one of the draughts about five o'clock this morning, but as it did not act, it was repeated at eight, which produced a full relief from the bowels; motions much more natural, and he is gaining strength.

This plan of treatment was continued regularly, and the bowels not suffered one day to go unrelieved; the motions became quite natural, and he was discharged from the hospital, for air and exercise, on the 12th February. He was, however, looked after for some time. He perfectly recovered, became a good and smart soldier, was made serjeant, and was strong and healthy when we left the regiment four years afterward.

CASE CXXVIII. — *Acute Hepatitis; Abscess opening into the Colon. — Perfect Recovery.*

CORPORAL ANDREW MURRAY, Madras European Regiment, of a strong and full habit, and a healthy young man, about 26 years of age. Admitted 7th January, 1813, on the march, with acute pain in his back and shoulder, interrupting his breathing; his tongue is foul and loaded; pulse full and strong; belly bound. — Apply twenty leeches immediately. Pulv. purg. stat.

Vespere. — The leeches relieved him, but the pain returned again in the afternoon; and when we saw him he could not sit up; his pulse was full and strong; he had vomited frequently, but had not been purged. — Take $\mathfrak{z}\text{xx}$. of blood from the arm immediately. The blood was neither buffed nor cupped. Apply a blister to the side. Pulv. purg. stat. Enema purg.

Ten o'Clock, P.M. — Fully purged, and infinitely better. — Calom. gr. viij. h. s. s.

8th. — Purged frequently in the night; feels better this morning; pain still continues in a slight degree; blister rose well; pulse small and quick, upwards of 100. — Calom. gr. vj. stat. Tamarind water for drink.

Vespere. — Purged three times; pain still in the shoulder. — Calom. gr. viij.

9th. — Has been fully purged; the pain in his side is easier, but he has still pain in his shoulder; thirst less urgent; tongue still foul, but cleaner than it was yesterday; he has no cough; pulse 96 in a minute, small and hard. — V. S. $\mathfrak{z}\text{xvj}$. Calom. gr. viij. stat.

Vespere. — The blood taken this morning is cupped, and has the inflammatory buff coat; he is much easier; pulse continues small and quick, about 96. — Calom. gr. viij. h. s. s.

10th. — Feels much better this morning; the pain in his shoulder considerably relieved, and also that in his side; pulse small and frequent; no thirst; good appetite; tongue cleaner; had only one stool in the night. — Haust. purg. $\mathfrak{z}\text{xij}$.

Vespere. — Very well purged, and feels generally better. — Repet. calom.

11th. — The pulse continues very quick, but he does not complain of pain; his tongue is much cleaner, and he has no thirst; stools of a green colour; appetite good. — Repet. haust. purg. $\mathfrak{z}\text{xij}$. Rub in $\mathfrak{z}\text{j}$. ungt. mer. nocte maneque.

12th. — Had the sensation in the night as if something had broken, which yielded a very considerable discharge, and he was frequently purged; we did not see the stools and cannot be certain, but we consider that an abscess has emptied itself into the colon. — Cont. frictio. Pilul. hydr. gr. v. h. s. s.

13th. — Feels very much better in every respect this morning, though he still feels a soreness and a slight pain when he lies on the right side; bowels regular; mouth slightly affected. — Cont. ut antea. — 14th. No alteration.

15th. — Mouth slightly affected; pain in the back and shoulder quite gone. — Garg. alum. Pulv. purg. Discont. mer. frictio; et pilul.

16th. — Was seized this morning with a very profuse warm perspiration, after which he felt quite exhausted; he has no pain; pulse good; tongue clean; he was very much purged yesterday. — No med.

17th. — Pain quite removed, but has not had any motion. — Haust. purg.

18th. — No complaint. — No med. — From this time he recovered, and required nothing farther than attention to his bowels; and was discharged a few days afterwards perfectly restored to health. He continued with the regiment in good health for many years afterwards.

CASE CXXIX. — *Abscess of the Liver breaking in upon the Lungs.* — *Recovered.*

OWEN KEATING, ætat. 29, His Majesty's 53d Regiment. 3d July, 1819. Admitted this morning into the Madras General Hospital, with dysenteric symptoms; complains also of pains in the right hypochondriac region; stools of a green colour, scanty, no tenesmus; pulse and skin natural; tongue foul; very thirsty. — Sumat. hydr. submur. gr. x. stat. post horas tres; ol. ricin. ℥j.

Vespere. — Bowels freely opened. — Repet. calom. gr. x. cum pulv. antim. gr. iij. h. s. Capiat haust. salin. tertiâ quâque horâ.

4th. — Feels better this morning; was purged four times in the night; tongue loaded; has pain in his side, under his fourth rib, when he drinks any thing; pulse small. — Mist. purg.

5th. — Tongue black and loaded; still feels pain in his side; pulse hurried and quick; face pale; stools clay colour; has taken the saline mixture. — Pilul. hydr. cum calom. three times a day. Haust. amar. cum sennâ, ℥ij. nocte maneque.

6th. — Feels much better; stools green colour, with hardened fæces; tongue black; pulse small and hurried; was only purged twice. — Mist. purg. ℥iij. stat. Cont. ut antea.

7th. — Tongue continues black and furred; stools yellow and watery; pulse small; skin cold. — Enema stat. R Aquæ ammon. ℥xxx.; spirit. laven. comp. ℥j.; aq. menth. ℥ij. M. ft. haust. stat. Repet. pilul. et haust. amar. cum sennâ, ut antea.

No change in the symptoms occurred till the 13th. — The pills, enema, and bitter aperient draughts, were continued.

13th. — Tongue lost the blackness entirely; he is better in every respect — Cont.

Three o'Clock, P.M. — Seized with violent pain in the region of the liver, which impedes his breathing, attended with cough, and a sudden and great expectoration of pus; skin rather cold, with a profuse perspiration over it; pulse feeble. — R Æth. vit. ℥j.; mist. camph. ℥jss. M. ft. haust. stat. cap. Fetus parti dolenti.

Six o'Clock, P.M. — Pulse 122 and small; skin warm, with perspiration; tongue loaded with a yellow mucus; cough continues, with copious expectoration; about

three pounds altogether have been discharged; pain particularly felt just under the margin of the ribs of the right side and up towards the breast; breathing still considerably impeded. — Cont. haust. cum æth. sulph. et mist. camph. ut antea. Repet. fatus.

Half-past Six o'Clock, P.M. — Pain continues very acute about his right breast. — App. hirud. jv. parti dolenti. Cont. fomentation and draught.

14th. — Pulse 114, small and fluttering; skin cool and with a cold moisture; a rough noise in his chest when he breathes, as if the bronchi were filled with matter; eyes lively; pupils less dilated than they were; expectoration of matter ceased last night at nine o'clock; still feels pain in the right side between the diaphragm and the superior convex surface of the liver; has very little cough, but he is evidently oppressed; has had stools this morning and walked to the commode. — Keep his bowels open with enemata. He feels relief from the draughts. Cont. them and the fomentations. Arrow-root, milk, &c.

Evening. — Sputa pure pus; pulse 140 in a minute; skin warm and moist; less expectoration; breathing easier; his belly open; tongue furred and yellow, not dry. — Mist. salin. febrif. cum antim. tart. gr. jss.

15th. — Difficulty of breathing excessive; there seems fulness over the whole abdomen; pulse 120; skin moist and warm; has not had a stool since yesterday morning. — Enema. Cont. foment. Repet. mist.; and apply a warm plaster over the chest.

Vespere. — Pulse 116, very weak; skin warm and covered with moisture; less pain, and he breathes better; his bowels have been well opened; stools perfectly good. — Cont.

16th. — Pulse 112, more firm than it was; skin more natural; tongue rather foul, not black; feels easier; some oppression still in his breathing, but he has less pain generally; sputa pure pus, but not so much in quantity as before; bowels regular. — Repet. enema. Cont. ut antea.

Vespere. — Continues nearly the same; bowels opened by the enema; expectorates occasionally. — Cont. mist. salin.

Nocte. — Cough rather troublesome. — R Tinct. opii camph. ʒij.; æth. vit. ʒj.; stat. Mist. camph. ʒjss.

17th. — Pulse 116, small, and rather weak; skin cool, and a moisture over his forehead; tongue yellow; pain in his breast easier, and he breathes with more freedom; sputa thick tenacious mucus, with spots of pus; bowels very well. — Cont.

Evening. — A wound which he received in his thigh has broke out and discharged a

quantity of pus, with several small stones; pulse 112, very irregular and fluttering; skin of his hands cold, and covered with perspiration, perhaps from exposure to the air, as his body feels warm; he has much less pain in his chest, and breathes with more freedom; the wound in his thigh was fomented, and a quantity of pus came away, but no stones. — R Magnes. sulph. ʒv.; aquæ menth. pip. ʒiij.; tinct. lavend. comp. ʒss. M.; p. m. s. Cont. mist. ut antea.

18th. — Pulse very small and weak; skin cold, and rather clammy; says he is much easier; not so free an expectoration; there was a considerable discharge from the wound in his thigh. — Cont. med. Sago and port wine.

Vespere. — Pulse continues quick and small, 120 in a minute; skin warm, but still covered with perspiration; stools copious, feculent, and of a natural colour; tongue rather cleaner; some thirst; cough somewhat troublesome, but very little expectoration; side and breast easy, as also his thigh; took the sago and wine very well to-day for his breakfast and dinner. — R Decoct. cinchon. ʒjss.; tinct. cinchon. ʒij.; acid. sulph. dilut. ℥xx. M. ft. haust. tertiâ quâque horâ sumend.

19th. — Pulse firmer, 110 in a minute; skin more natural; says he is much better; no matter in his expectoration. — Cont. cort. ut antea.

20th. — Pulse hurried and confused, 120 in a minute; expectoration difficult; cough troublesome, and some uneasiness in his chest; voice hoarse; skin natural. — Repet. mist. purg. R Mist. camph. ʒjss.; tinct. opii, comp. ʒj.; tinct. scillæ, ℥xx.; sacch. alb. q. s. Ft. haust. stat. sumend. Cont. haust. cinchon. ut antea.

21st. — Pulse 108, not strong; feels easy; very little expectoration; oppression less; passed a good night, but seems to breathe quick; skin natural. — Cont.

22d. — Pulse small and fluttering, 99; is stuffed in his chest, and his countenance is bloated; no pain in his breast, or difficulty of breathing, but has pain in the region of the liver; he cannot lie at all on the left side, and he has a short cough; bowels regular; stools natural; skin covered with moisture; considerable fulness in the right hypochondriac region, and the appearance of a large tumour, but he has no pain, except along the margin of the ribs to the spine. — Apply a large poultice round the whole hypochondriac and epigastric regions, with unguent. mercur. ʒij. Cont. haust. camph. bis in die. Cont. cort. Per. ut antea. A flannel shirt.

23d. — Fulness over the whole abdomen, and a tumour formed about three inches from the spine, between the fifth and sixth ribs; he cannot lie on the left side, but can stand up without any difficulty; stools natural; pulse hurried and weak, 110 in a minute. — Cont. poultice. Cont. med. ut antea.

25th.—Looks much better; fulness in the hypochondrium, and general swelled appearance of his face, neck, and chest, gone; breathing still rather oppressed; no pain in his chest; short cough continues; pulse hurried and confused; skin cool and moist; bowels regular; stools feculent and natural; tumour in the side seems to be diminished, but there continues an evident fulness.—Cont. ut antea.

27th.—Continues much better; the tumour towards the posterior part of the liver considerably decreased; pulse not so irregular, and firmer; skin natural; bowels regular.—Habeat pot. acid. nitros. ad libitum. Cont. omnia.

30th.—The oppression in his chest is better; his pulse 96, and firm; feels slight pain in the right side, immediately under the hypochondriac region.—Apply three leeches.—Cont. med. omnia.

31st.—Feels pretty easy; some tension in the epigastric region still; bowels open; felt relieved after the application of the leeches, complained of yesterday.—Cont. omnia. Nitro-muriatic wash to be applied to the abdomen.

August 1st.—Continues much better; bowels regular; pulse 100, and pretty firm; skin natural; tongue clean; cough less; side quite easy.—R Decoct. cinchon. $\bar{3}$ ij.; tinct. cinchon. $\bar{3}$ ij.; acid. sulph. dilu. \mathfrak{mxx} . M. ft. haust. quartis horis capiend. Cont. acid. nitros. ad libitum, ut antea; nec non nocte manequa, lotio pro abdom. Vin. rub. $\bar{3}$ vj.

4th.—The oppression in his breast removed, and he is recovering rapidly; cough very slight.—Cont. omnia.

6th.—Says he feels quite well, although he seems to have some oppression still when he breathes; skin natural; tongue clean; appetite good.—Cont. haust. cinchon. et vin. ut antea.

7th.—Perfectly free from pain and uneasiness; looks greatly improved; bowels regular.—Cont.

From this date he continued to recover, but was not discharged for a considerable time, in order to prevent any relapse before his health was completely restored. He recovered perfectly.

Remarks.—The circumstances most deserving of notice in this case were, the profuse expectoration of pus during the 13th and 14th of July, and the breaking out of the old wound in the thigh. Probably the irritation and discharge from this part acted as a derivative from the seat of disease in the liver and lungs. The nitric acid internally, and the nitro-muriatic lotion externally, were appropriately employed in this case, and were extremely beneficial.

SECTION IV.

Cursory Remarks on Hydatids of the Liver.

IN the course of our pathological inquiries we have occasionally observed hydatids in the substance of the liver, under its proper coat, or between it and the peritoneal covering. The concave part of the organ is most frequently the seat of these parasitic growths. They vary in size from that of a millet seed to the usual bulk of the head of a full-grown foetus. When productions of this latter size, or of large dimensions, are formed, resembling hydatids, the existence of hydatids within them should be ascertained, and if they are found, their independence of the cysts containing them should be proved; for it is not very uncommon to find simple cysts mistaken for hydatids; and even when hydatids are present, the cyst containing them may be viewed as the principal hydatid. In the case which follows this section, the hydatid, which was of very large dimensions, floated in a quantity of a whey-coloured fluid, contained in a cyst which was evidently formed from the development of the hydatid, and the effusion of the fluid, between the proper covering of the liver and its peritoneal envelope. In the majority of instances the large hydatids are observed to contain a number of smaller formations of the same kind: the largest are often broken, as if they had been burst by the development of those within. The cyst containing them generally presents a fibrous structure, and in some cases a fibro-cartilaginous appearance. In some cases the enveloping cysts form adhesions to adjoining viscera, and afterwards open and discharge the contained hydatids into them, in a somewhat similar manner to the opening of an abscess. Thus hydatids of the liver have been discharged into the colon, duodenum, stomach, or peritoneal cavity.

With respect to the *Symptoms* indicating the presence of hydatids in the liver, or connected with it, but little can be advanced. In the early stages of their growth they are seldom indicated by symptoms which are

in any way peculiar to them. There are frequently observed great paleness and sallowness of the countenance, with a leucophlegmatic aspect; shooting pains in the region of the liver, without any marked disturbance of the pulse, which is more usually weak, soft, and languid, than the contrary. When they become more fully developed, so as to increase the bulk of the organ, then a sense of weight, oppression, and suffocation, is felt, sometimes with a dry cough; and a tumour becomes evident at or near the epigastrium, without much general tumefaction of the right hypochondrium and region of the liver. The tumour is sometimes unequal, obscurely fluctuating, and soft; and it generally presents neither the discoloration of surface nor the hardened base remarked during the progress of external pointing in abscess of the organ. The tongue also is very different from what it usually is in abscess: it is pale, and seldom loaded or dry. The pulse is not accelerated unless the cyst becomes inflamed, or forms adhesions to adjoining parts, when the signs of inflammatory action begin to manifest themselves.

As respects the *Treatment* of hydatids of the liver, we have not much to advance. If the cyst containing them were to form adhesions to the parietes of the abdomen, then advantage might be derived from an operation similar to that resorted to for the removal of purulent collections in the liver, and performed in a corresponding manner, but with still larger incisions, and a freer outlet for both the hydatids and the surrounding fluid contained in the cyst; but such adhesions seldom or never take place. When the tumour is large, with fluctuation, and the case of the patient urgent, we would recommend the operation to be performed, rather than allow the patient to sink without an effort calculated to produce any benefit. Urgent symptoms must be combated as they arise, or palliated according to the characters they may present, and state of the patient. The energies of the digestive functions, and, through them, of life itself, should be supported, and morbid secretions and accumulations carried off from time to time. When inflammation supervenes, then the antiphlogistic treatment must be adopted; but in this case little hopes can be entertained of any permanent advantage, unless the inflamed cyst adhere to some part of the abdominal parietes, and give rise to appearances which shall lead to the performance of an

operation for the removal of its contents. When inflammation thus supervenes in the cyst containing the hydatids, or in the adjoining part of the liver, the disease very closely resembles abscess seated in the concave surface of the organ, and is generally treated as such: indeed it is almost impossible, unless from the early history of the case, to distinguish between both these morbid states; and, even after the most attentive observation, no precise idea can be formed upon the subject, the hydatid growths generally assuming more or less of the features of the more chronic cases of abscess of the liver, excepting only the states of the pulse and tongue as already alluded to, and the dysenteric disorder frequently accompanying the latter disease.

CASE CXXX.—*Large Hydatid of the Liver; Ulceration of the small and large Intestines.*
(See Plate XIX.)

FRANCIS ELLIOT, ætat. 20, a healthy, robust man, fair complexion, and red hair; has been two years in India, and with the company of artillery at Cullajee, in the southern Mahratta country; admitted into the General Hospital 18th June, 1822; was attacked with intermittent fever about three or four months since, and, as he did not recover, was sent to Madras for change of air, but no account of his case accompanied him.

On examining his side, a very considerable enlargement of the liver was found extending far below the ribs into the umbilicus; says he has a great deal of pain in the region of the liver, which shoots through his breast, shoulder, and down the back, and is increased on pressure or a deep inspiration; appetite impaired; bowels costive; tongue foul and furred; pulse 90, full and soft; skin moist. There is a seton in his side, which he says has been there for the last three months, but it discharges little; has been leeches and blistered, and repeatedly salivated, according to his own account.—R Calom. gr. x.; pulv. antim. gr. iij.; opii puri, gr. j. Ft. pilul. h. s. s. Mist. purg. ʒjv. cras mane sumend. Apply the nitro-muriatic wash over the tumefaction.

19th.—Has not been purged; the enlargement in his side is very considerable.—Repet. mist. purg., et repet pilul. calom. h. s. s.

20th.—Pain in his side increased, and it appears to be more swelled; says the medicines have operated well, but he has taken care not to let us see what has passed from his bowels.—R Pulv. purg. Cont. lotio, ut antea.

Evening.—Side more painful; purged twice, not copiously; tongue very foul; skin

cool; pulse good. — Appl. hirud. xx. lateri; and afterwards apply a large poultice. Calom. ut antea.

21st. — Felt more pain in his side in the night, and considerable fulness over the abdomen; the tumour is very distinctly felt; tongue foul; pulse calm, 80, soft. — R Pilul. aloë. et calom. 1 ter in die; et mist. amar. cum sennâ, ℥ij. nocte manequè.

22d. — Enlargement the same, less painful; tongue continues foul. There is not that disturbance in the system that we should have expected from the size of this tumour, nor does there appear so much pain on examining it, though he certainly complains of pain at times; but there appears an indolence in the tumour and apathy in the man that does not bespeak great excitement; his pulse is always good.

24th. — Had an epileptic fit this day, which lasted near an hour; says he had one on the march, and was subject to them in the field; the pain in his side increased very much in the afternoon, and interrupted his breathing; bowels are regular; motions not morbid, and not perfectly healthy; pulse rather accelerated; skin warm and moist. — Apply fifteen leeches to the side where he felt most pain. R Calom. gr. x.; opii, gr. jss.; pulv. antim. gr. iij.; syrup. q. s. Ft. pilul. h. s. s. Mist. purg. ℥jv. cras mane sumend.

25th. — Complains of pain in the epigastric region and right hypochondrium, increased by the slightest pressure, though the indurated tumour remains stationary; had rigors, he says, in the night, with lightness in the head, sickness at stomach, and cold sweats pouring from him, to use his own words; his bowels are torpid, not regularly acted upon. — Mist. purg. ℥jv.; to be repeated every three hours till full dejections are procured; took three doses before he was purged; motions dark-coloured and clay-consistence. Cont. pilul. aloë. cum calom., et mist. amar. cum sennâ. Cont. lotio nitro-muriat., and poultice, ut antea.

26th. — Bowels freely opened; motions very foul and offensive; pulse and skin natural. — Cont.

July 1st. — Had rigors last night, but much slighter than usual, and lasted a shorter time; in every other respect the same; mouth tender. — Cont. ut antea.

2d. — Feels more pain at the epigastrium, and there is evidently more fulness; pulse accelerated; tongue foul, as usual; bowels open. — Apply fifteen leeches to the epigastrium. Cont. pilul. &c. &c.

3d. — Feels much easier from the leeches. — Cont.

4th, 5th, and 6th. — Has pain in his head; in all other respects the same. — Apply twelve leeches to the temples.

7th, 8th, 9th, and 11th. — Had shivering fits; no other change.

14th. — Had a feverish attack at ten o'clock, P.M.; cold and hot fit; severe pain in the head; very thirsty; tongue foul; skin warm; pulse accelerated. — Apply twelve leeches to the temples. Mist. salin. febrif. Calom. gr. x.; opii, gr. j. h. s. s. Cont. ut antea.

15th. — Headach relieved. — Mist. purg. Cont. mist. salin. ut antea, &c. &c.

16th. — Pain in the side increased, and severe headach. — Apply fifteen leeches to the temples.

The daily reports from the 16th to the 29th were the same, and the same treatment employed; but on this day the pain and swelling of the belly and enlargement of the liver increased, and his breathing became affected. 29th. — He was purged copiously, stools white and slimy; pulse soft; skin cool; tongue foul. — Apply twenty leeches to the side, and continue the poultice. Enema purg. Cont. mist. salin.

Evening. — Complains of pain on pressure on the abdomen, and he has not experienced any relief from the leeches. — Apply twenty-five leeches to the abdomen immediately. R Calom. gr. x.; opii, gr. j.; syrup. q. s. Ft. pilul. h. s. s.

30th. — The leeches were not put on, from the neglect of the pupil; pain still continues; pulse hard; skin hot; bowels costive. — Apply the leeches now. Enema purg., et mist. purg. $\bar{\text{z}}$ jv. Cont. mist. salin. Sago diet.

31st. — Had shivering last night; complains still of pain all over the abdomen, and particularly towards the lower part, where he cannot bear the least pressure; passed scanty, slimy stools mixed with blood; tongue foul; pulse full and hard; skin moist, but warm; countenance anxious; urine scanty and high-coloured; feels very thirsty. — V. S. $\bar{\text{z}}$ xxxij. Apply twenty leeches over the belly. Purging enema every two hours. Calom. gr. x.; opii, gr. j. stat. After the leeches come off, apply the poultice. Continue the saline mixture.

Vespere. — Some relief to the pain after the bleeding, but his breathing is still very difficult, and his countenance anxious; he is very restless; pulse 110, firm and hard; his legs drawn up to his body with pain; received some ease from the injections; has passed no blood, but stools slimy and watery; tongue foul and moist; the blood drawn in the morning was cupped, but not buffed. — V. S. ad $\bar{\text{f}}$ j. stat. Appl. hirud. xx. abdom. stat. Cont. purg., et hab. tart. emetic. gr. ss. in aquæ, $\bar{\text{z}}$ jss. tertiâ quâque horâ. post. hirud. stat. Fetus pro abdom.

August 1st. — The blood drawn last evening was cupped, but not buffed; he finds himself much easier this morning; has no pain, even on pressure, over the abdomen, except in the region of the liver; complains of tenesmus; has had several feculent

evacuations; says he feels weak; tongue foul and moist; pulse 120, pretty firm; skin cool, moist, rather clammy; has nausea at the stomach. — App. stat. empl. lyttæ largum abdom. Hab. stat. enema purg. Sumat. pilul. ex cal. gr. x., et opii puri, gr. jss. stat. et h. s. Cont. mist. salin., et post horas tres, sumat. mist. purg. $\bar{3}$ jv.

2d. — Complains of some pain at the right side of the abdomen, in the region of the cæcum, which is increased by pressure; says he has severe tenesmus; stools watery; tongue foul and moist; respiration rather difficult; countenance not quite so anxious; feels restless; pulse 120, irritable; is very thirsty. — App. hirud. xv. reg. cæc. abdominis. Sumat. stat. haust. ex ol. ricini, $\bar{3}$ jss. Hab. suppositorium opii. Pilul. ex calom. gr. x., et opii, gr. ij. h. s. Cont. mist. salin.

5th. — Says he is better; had a good night's rest; has had several stools containing evidently purulent matter; feels no pain; tenesmus much diminished; countenance improved; pulse 118, irritable; skin rather hot, moist; is very thirsty. — Sumat. ol. ricini, $\bar{3}$ j. stat. Cont. fots pro abdom., et haust. anodyn. Hab. enema ex aquâ oryzæ et ol. ricini. Toast and water for drink.

Vespere. — Had several feculent, offensive stools; but no pus observable in them; respiration still a good deal affected; says he feels weak; no pain nor straining; tongue foul, furred, rather dry; pulse about 120, irritable; skin moist, hot. — Hab. stat. pilul. ex calom. gr. x.; opii, gr. j. Hab. h. s. haust. anodyn. ex tinct. opii, \mathfrak{m} xxx.

6th. — Had five or six stools last night, which evidently contain purulent matter; he says he has no pain; no straining; he slept pretty easy and well last night; tongue foul, furred; pulse 120, irritable; skin moist, rather clammy. — Cont. vinum. Habeat ol. ricini, $\bar{3}$ ss. stat. Sumat infus. cinch. $\bar{3}$ js.; cum acid. sulph. dilut. \mathfrak{m} x. bis die. Toast and water for drink. To have arrow-root or sago.

Vespere. — He is much weaker than in the morning; scarcely articulates; says he is dying; on being asked if he felt pain any where, he points with his hands to his abdomen; stools still purulent; complains of straining, and says he makes very little water; pulse 120, irritable; skin rather cold; a cadaverous smell from him. Died on the 7th, at 10, A.M.

Examination. — An immense cyst, containing upwards of a quart of water, with an hydatid floating in it, was found attached to the concave surface of the liver. (See Plate XIX.) The substance of the organ appeared to be diminished in size, and easily broken down. The internal surface of the small intestines was covered with red

spots, and ulcerations throughout. Ulceration was also found in the colon; and the bowels contained purulent matter, similar to what was discharged in his evacuations during the latter days of his illness.

The cyst containing the water and hydatid was developed between the peritoneum and proper covering of the liver, in the concave surface of the right lobe. Numerous vessels were very conspicuous, ramifying from the liver through the walls of the cyst (see the Plate).

It would have been desirable that the head had been opened, as the existence of hydatids within its cavity was rendered probable by the presence of epilepsy.

SECTION V.

Precautions on Change of Climate for the Adoption of those subject to, or recovering from, Diseases of the Biliary Organs.

WE have already anticipated much of the present subject in a former section, respecting change of climate from a warm to a cold country, for complaints of the stomach. To this section we refer our readers; for all that we have stated there is also fully applicable to those who proceed from India to Europe, after having suffered from hepatic disease, or who have acquired a liability to such disease from their residence within the tropics. With respect to diet, regimen, and clothing, we have scarcely any thing at present to offer in addition to what has been already advanced in that section, and in other parts of this Volume.* The necessity of conforming strictly to the injunctions laid down as to this subject, during the time of passing to a colder climate from a warm one, and for a very considerable time after the change has been effected, will soon become apparent to those who are at the time suffering in any degree from hepatic diseases. Those who have acquired merely the tendency to those maladies, or who

* See pp. 100, 248, and 287.

are subject to functional disorder only of the biliary organs, will generally at first experience but little inconvenience from the change, and will therefore consider constraint of any kind, whether of diet or regimen, very unnecessary, and look upon a return to a colder and more salubrious climate all that is necessary towards a restoration of health. This is doubtless correct in very many instances; but it is by no means so in all. On the contrary, many who have either suffered only from functional disorders of the liver, or who have acquired merely a tendency to them during their residence in the east, or within the tropics, have been attacked with active disease soon after their return to Europe; and some who have suffered more seriously in these regions have had their complaints aggravated after a short residence in England, although they had been benefited during the voyage to Europe. This result of change to a colder climate does not, however, proceed altogether from the temperature, or from the state of the seasons, but, in a great measure, from the neglect and imprudence of the patient. Frequently, however, the influence of a colder atmosphere is materially prejudicial, particularly in constricting the vessels on the external surface, in determining an increased flow of blood to the large internal viscera, and promoting congestion and obstruction of those organs which have been weakened by previous disease or the influence of climate. In order, therefore, to counteract this effect of temperature, warm clothing should be adopted, and every part of the body, especially the lower extremities, kept warm, the invalid carefully avoiding exposures to cold, particularly to cold combined with moisture, and to the night air.

Another very frequent result of change from a warm to a cold climate is a diminution of all the secretions of the body, particularly the secretions of the skin and of the liver. Hence a plethoric state of the vascular system speedily supervenes in many cases; and if the external surface of the body and surface of the lungs be even momentarily subjected to the influence of increased cold, particularly if combined with moisture, after the circulating fluid has been elicited to these parts by hot rooms and crowded assemblies, the great mass of blood is thrown upon the internal viscera, which, if not relieved by a free secretion, become the seat either of congestion or of

inflammation. Hence it is that attacks of hepatitis or of dysentery so frequently supervene upon sudden changes from a high to a low temperature. In order to guard against this, the precautions just mentioned should be strictly observed; the diet should be moderate, light, and easy of digestion; and the patient should abstain entirely from the use of the strong wines imported into this country: above all, he should attend to the state of his bowels. The functions of this part of the economy should be promoted, whenever they seem to flag, by means of gentle aperients or tonics combined with small doses of deobstruent salts. For this purpose, a pill, consisting of one grain of blue-pill, three of the aloes and myrrh pill, and one of Castile soap, may be taken at night for some time; and a wine-glassful of a mixture consisting of equal proportions of the compound infusions of gentian and senna, with some neutral salt, and a little compound tincture of cardamoms, early in the morning.

Where there has been previous disease of the liver, with enlargement of the viscus, a large plaster, formed of equal parts of the emplastrum picis comp. and the emplastrum ammoniaci cum hydrargyro, should be placed over the right hypochondrium, and worn for several months; whilst the Cheltenham waters, the factitious Carlsbad waters, or any of the neutral salts much diluted, may be taken through the day. In cases of this latter description, invalids, upon their return to Europe, will often find great advantage from drinking daily a decoction of the leontodon taraxacum, to which may be added some of the sub-carbonates of soda or of potash, with a little of the spiritus ammonia aromaticus, or spiritus ætheris nitricus, or of both, as circumstances may indicate, the pill already mentioned being taken at bed-time. Whenever persons return from India, or warm climates, with actual disease, they should intrust themselves to a physician of character in England, who has had experience of the diseases of intertropical countries from actual residence in them: and on this point the practitioner under whose care they have been before they left India will be able to inform them; and he also should furnish them with an account of the progress of their disease, and of the practice adopted for its removal, in order that it may be treated with greater hopes of advantage upon their arrival in Europe.

Patients who are convalescent from any of the diseases treated of in this part of the work, will generally be benefited by a change, for a longer or shorter period, to a purer air and cooler temperature than are generally to be enjoyed within the tropics. Great benefit will often be derived from a sea voyage, and the enjoyment of a pure sea air. But in order to obtain the full advantages of these changes, due precautions ought to be observed during the time of their being effected. They should be made in such a manner as to ensure a very gradual diminution of temperature, and every comfort necessary to the state of the invalid. Patients who have suffered from hepatic diseases have generally a very marked predisposition to pulmonary disorders, on sudden vicissitudes of temperature, attended with a return or aggravation of the original malady. Thus it frequently is observed, that individuals returning to Europe, from India or other warm climates, with functional or organic disease of the liver, become extremely liable to disorder of the respiratory organs. This, in the majority of instances, arises from the extension of the original malady to the pleura and lungs, the invalid thus becoming the subject of hepatic disorder complicated with disease of the thoracic viscera. This complication is generally the consequence of imprudent exposures to cold after the body has been overheated, to the impression of cold night air upon coming out of warm and crowded rooms, and of cold or damp applied to the lower extremities. It not infrequently also arises from exposures of an opposite nature, but equally injurious in their effects,—namely, to the breathing a very warm and close atmosphere immediately upon coming out of a cold and dry air. Many of the consequences proceeding from changes of this description have been imputed to other sources, and hence the real cause of mischief has been too frequently and injuriously overlooked. The invalid, so susceptible to disease, comes from a cold and pure air into a heated room, and after remaining there for some time, until the constricted state of the extreme vessels on the surface of the body and in the lungs is overcome, and reaction of the vascular system, with all its consequences of free secretion and exhalation, induced, again rushes into a cold and dry air, occasioning thereby a constriction of the secreting surfaces, and a determination of the blood, which had been elicited to the external surface of the body, to the large internal viscera, there to induce

congestion, and ultimately inflammatory action. It is often difficult to say which of these exposures is most detrimental to the system; but that either the one or the other, according to the state of the individual, proves prejudicial, cannot be doubted.

The same causes, even when they fail of inducing pulmonary disease,—to which long residence in a warm climate predisposes all Europeans,—generally aggravate hepatic disorder when it is already present, or convert, as we have already stated, functional disorder into inflammatory action and organic change. In order to overcome this tendency to more severe and more complicated disease by removing to a cold country from a warm climate, the invalid should be most careful in making the change as gradually as possible,—in preserving a free state of the cutaneous function,—in avoiding all hurtful exposures to cold and moisture,—in living temperately as respects both eating and drinking,—and in keeping up a gentle action on the bowels and on the large secreting organs placed in the abdomen. Beyond this the invalid or convalescent should not attempt to proceed. When these means are not serviceable, or seem insufficient for the extent and severity of his maladies, he should resort to medical aid, should make a judicious choice of his physician, and be entirely guided by the instructions which he will receive from him.

BEADLOW'S CASE, No 1.

A



A

—over with the appearance of having three distinct. Hays.

EXPLANATIONS OF THE PLATES.

PLATE I.

BEDLOW'S CASE, Nos. 1 and 2.

[See pp. 535—538.]

EXAMINATION, TWO HOURS AND A HALF AFTER DEATH.

The Liver enlarged, with the appearance of three distinct Abscesses.

A. A. A. THE situations in which the abscesses seem to point.

The circumstances more particularly deserving notice in this Plate are, the inflamed appearance of the viscus; the blue veins ramified in its surface, and between the prominences occasioned by the purulent collections; the minutely granulated character which its surface in every part presents; and the extent to which the right lobe had pressed upon the diaphragm, and indeed risen up into the right thorax.

PLATE II.

Longitudinal Section of the Liver (Plate I.), shewing the existence of two Abscesses, one situated in the centre, and pointing towards the concave surface of the right Lobe; the other in the concave part of the left Lobe.

THE points deserving notice in this Plate are, the highly inflamed state of the internal structure of the organ,—the absence of distinct cysts,—and the breaking down of the substance of the viscus amid the purulent collections. This Plate illustrates a frequent condition of the parts in abscess of the liver as observed in India.

BEDDOW'S CASE, No 2.



Section of the *Lower* (plate 1) showing two *Alveoli*.

Engraved by J. Steuart.

HAND'S CASE, N^o 1.



Views of the Liver, with adhesions of the Diaphragm.

Painted by J. W. M. J. W. M. J.

PLATE III.

HAND'S CASE, Nos. 1 and 2.

[See pp. 539—541.]

EXAMINATION, TWO HOURS AND A HALF AFTER DEATH.

Abscesses of the Liver, with Enlargement and Adhesion to the Diaphragm, &c.

- A. A purulent collection formed near the anterior edge of the right lobe, with the appearance usually exhibited when the pus is partly absorbed, and the cyst retracting itself around its contents.
- B. A large abscess in the superior and posterior part of the right lobe of the liver, which rose into the right thorax, and adhered closely to the diaphragm.
- C. A portion of the diaphragm, adhering to the external surface of the abscess, much inflamed, and with numerous vessels ramified over its thoracic surface.
- D. The cut edge of the diaphragm, where the adherent portion has been separated from the remainder of this muscle.
- E. Minute and pale specks scattered over the surface of both lobes of the liver.

This Plate demonstrates well adhesion of the diaphragm to abscess of the liver, with inflammation of the former, and the encroachment of the right lobe upon the thorax.

PLATE IV.

Oblique Section of the right Lobe of the Liver (Plate III.), shewing four Abscesses, &c.

- A. Abscess, with inflamed appearance of the cyst.
- B. Abscess, seated close to the portal vessels.
- C. Abscess, the cyst of which adhered to the gall-ducts and adjoining viscera.
- D. The gall-bladder, containing a small quantity of pale bile.
- F. A small abscess.
- E. Section of vessels.

This Plate shews an inflamed state of the internal surface of the cysts of the abscesses, whilst the intervening structure of the organ is perfectly natural,—an appearance occasionally observed in abscess of the liver complicated with dysentery.

HAND'S CASE, No 2.



Section of right lobe of the Liver, showing Hepatoma.

Engraved by J. H. Thompson.

DONALDY'S CASE, No 1.



Theraps of the Liver rising into the right Thorax with congestion

Figured by J. W. H. 1847

PLATE V.

DONELLY'S CASE, Nos. 1 and 2.

[See pp. 547—550.]

EXAMINATION, TWO HOURS AFTER DEATH.

*Extensive Abscess of the Liver rising into the right Thorax, and giving the right Lobe
a globular appearance.*

THE whole of the left lobe, and the base of the tumour formed by the abscess in the right lobe, are of a blackish-brown colour. The nearly black base of the abscess is surmounted by a deep-red zone, and this by a yellowish apex, which adhered to the diaphragm. The deep colour of the surface indicated great congestion of the substance of the organ, which, although it did exist, was not present to a very great extent. The liver was much enlarged.

PLATE VI.

Longitudinal Section of the Liver (Plate V.)

SHEWING slight congestion of the internal texture of the viscus generally, with impaction and condensation of its structure around the purulent collection, which consisted of pure pus, without any loss of substance. The dark zone of congestion surrounding the abscess passes into red as the internal surface of the walls of the abscess is reached. This surface, consisting of fine condensed cellular tissue, appears like a mucous surface, but there was no cyst distinct and separable from the surrounding structure of the organ.

DONALDLY'S CASE, N^o 2.



Section of the Liver rising into the right Thorax.

Engraved by J. Smith.

London: Published by L. Donnelly, 105, Strand, 1825.

JUNTAJAN'S CASE, NO 1.



Showing shape of the Liver rising into the right Thorax.

PLATE VII.

JUNTIMAN'S CASE, Nos. 1 and 2.

[See p. 576.]

EXAMINATION, FOUR HOURS AFTER DEATH.

*Enlarged and inflamed Liver, with very large Abscess in the centre of the right Lobe,
which rose high into the right Thorax.*

THIS Plate represents an occasional appearance of the surface of the liver when abscess is formed in its internal structure. The whole surface of the organ is inflamed, and of a mottled or marbled hue, from patches of a yellow, red, brown, and purple tint.

PLATE VIII.

Transverse Section of the right Lobe of the Liver (Plate VII.), dividing a very large Abscess situated in its centre, and shewing the appearance of the Secreting Texture of the Organ.

THIS Plate demonstrates a very frequent variety of hepatic abscess. The internal structure of the lobe is impacted and stretched around the purulent collection, owing to the distension occasioned by it. The internal surface of the parietes of the abscess consists entirely of the substance of the liver, and is highly inflamed. The contents of the abscess were a pure pus, which was not surrounded by a distinct cyst.



Transverse section of the right lobe of the liver, dividing a large Abscess & demonstrating the appearance of the Sarcinatory texture

DONICLIFF'S CASE.



Enlarged Liver, studded throughout its substance with small Abscesses.

PLATE IX.

DONACLIFF'S CASE.

[See pp. 563—566.]

EXAMINATION, TWO HOURS AFTER DEATH.

The Liver much enlarged, inflamed, and studded in its Surface, and throughout its Substance, with small purulent Collections.

THE surface of the liver was of a brick-red, passing in some places into a reddish-brown colour, and variegated with very dark spots. Small collections of purulent matter were scattered through the surface of the organ, and elevated its investing membrane. The internal structure of the organ was very much inflamed, congested, and studded with numerous small collections of matter, similar to those situated in its surface: these consisted of a semi-fluid pus, and were deposited in the texture of the organ, without being surrounded by distinct cysts.

PLATE X.

MACLAUREN'S CASE.

[See pp. 481 and 483.]

EXAMINATION, TWO HOURS AFTER DEATH.

FIG. 1.—*Great Enlargement of the Liver, with chronic Inflammation and Congestion.*

THE surface of the liver of a very dark colour, indicating congestion.

A. The stomach.

B. The right lobe of the liver, having a spheroid form, owing to the great congestion of its substance. The internal texture of the organ was congested with blood, was of a dark, brick-red colour, more condensed and friable than natural, and the hepatic ducts loaded with a thick, dark-coloured, viscid bile,—a frequent condition of the liver in the diseases of this viscus as they occur in India.

FIG. 2.—*Shewing the Cæcum and Colon in a state of Inflammation throughout.*

The internal surface was sphacelated in some parts, and all the coats of the bowel were so much softened, as well as inflamed, that they were torn upon removing them from the body.

A. The omentum inflamed, and thickened.

B. The cæcum, inflamed, and its internal surface sphacelated.

C. The place where the colon was lacerated upon removing it for minute examination. A part of the torn parietes is removed, in order to shew the appearance of the internal surface.

MAC LAUREN'S CASE.

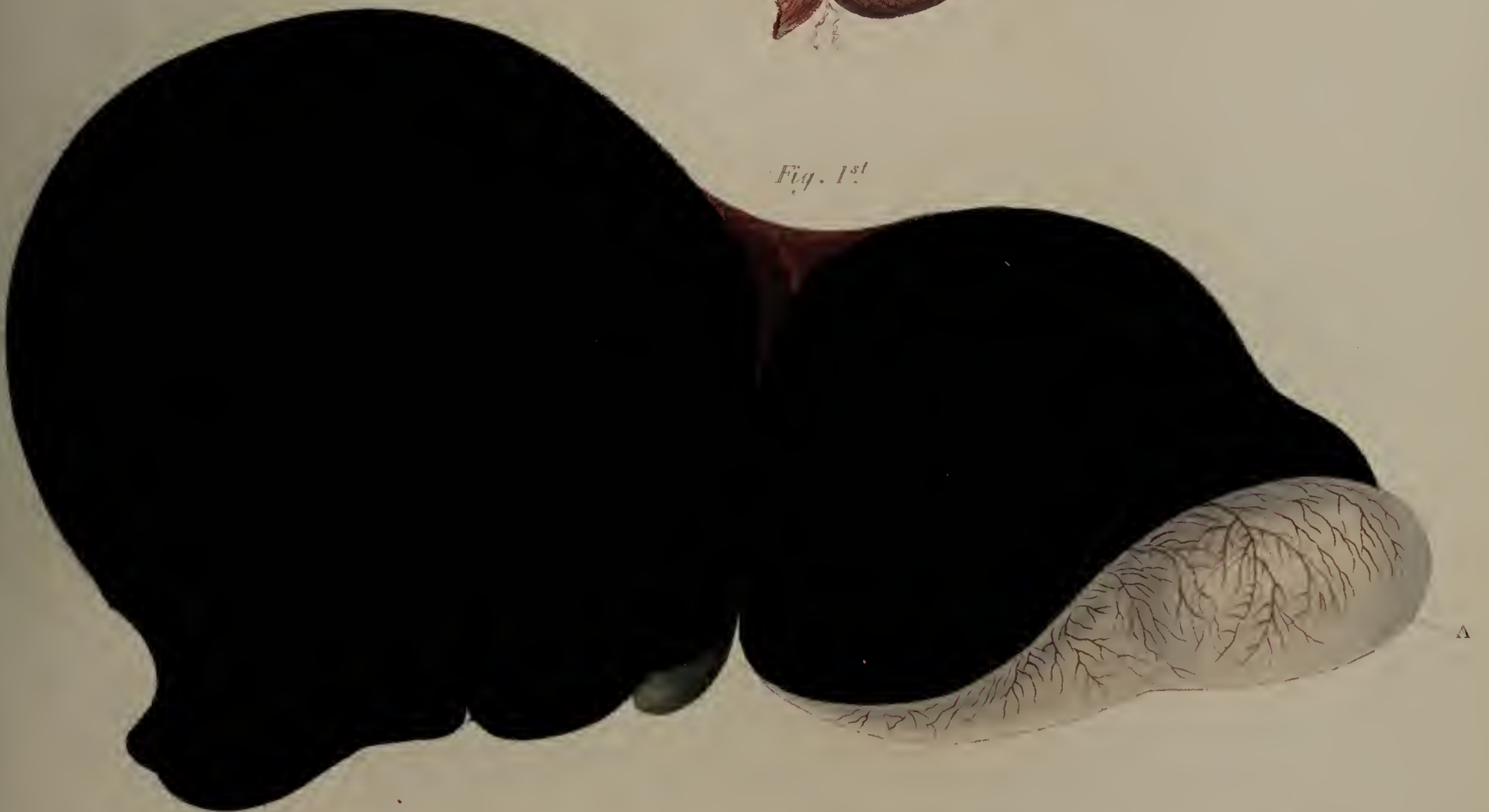
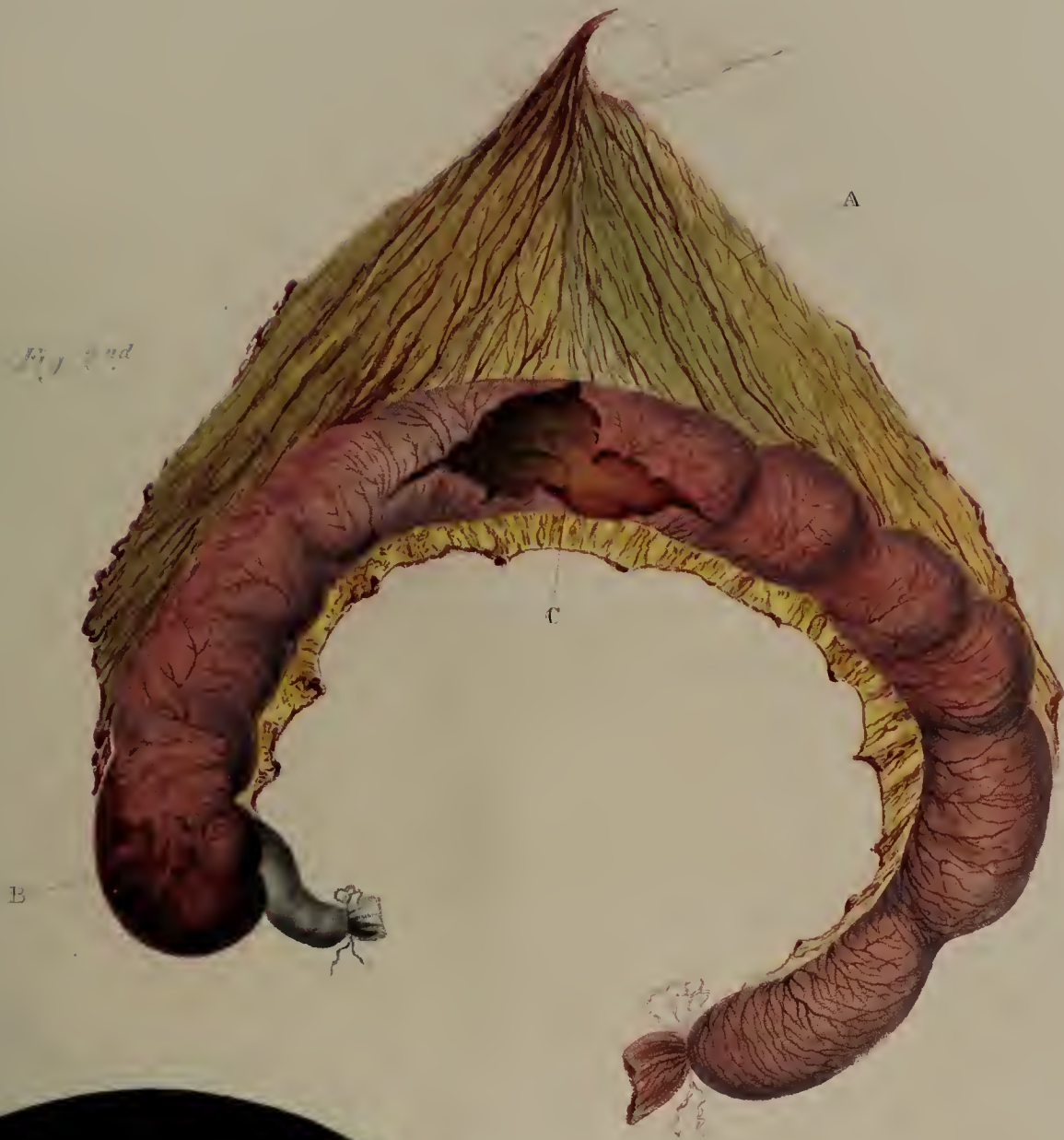


Fig. 1st. The Liver greatly congested and discoloured.—Fig. 2nd. The Colon Inflamed.

Engraved by J. Brown, sculp.

Printed by J. Brown, at the Office of the Edinburgh Review, No. 1, St. Andrew's Place.

MORRIS'S CASE.



Abscess of the Liver extending through the Diaphragm into the Lungs

Engraved by J. Stewart, Sen^r

London, Published by Longman, Rees, Orme Brown & Green, 1840

PLATE XI.

MORRIS'S CASE.

[See pp. 542 and 543.]

EXAMINATION, FIVE HOURS AFTER DEATH.

Abscess of the Liver, extending, at its posterior part, through the Diaphragm into the Lungs; the Liver greatly enlarged, and much softened.

FIG. 1.—*View of the convex surface of the Liver, adhering, at its posterior portion, to the ulcerated Diaphragm and Lungs.*

- A. The right lobe.—B. The left lobe of the liver.—*a a a.* Places where the purulent collection nearly approached the surface of the liver.
- C. The gall-bladder, full of bile.
- D. The lungs, torn from their adhesions to the diaphragm.
- E. A portion of the inflamed diaphragm pushed back, in order to shew the purulent formation which was beneath it.

FIG. 2.—*A view of the concave surface of the Liver, shewing the communication of the Abscess with the Lungs through the Diaphragm, and the ulcerated appearance of the surrounding Parts.*

- A. The right lobe.—B. The left lobe.
- C. The gall-bladder.
- E. The ulcerated entrance through the diaphragm, which is removed, communicating with the substance of the lungs on the one hand, and the substance of the liver on the other.

The liver was enormously enlarged, filling the greater part of the abdomen. Its surface was of a reddish-brown colour, streaked with deeper shades, and thickly studded with minute specks of a brighter hue. The substance of the organ was uncommonly softened, in contact with the purulent matter it contained, and the part nearest the diaphragm deeply and irregularly ulcerated.

PLATE XII.

LYNCH'S CASE.

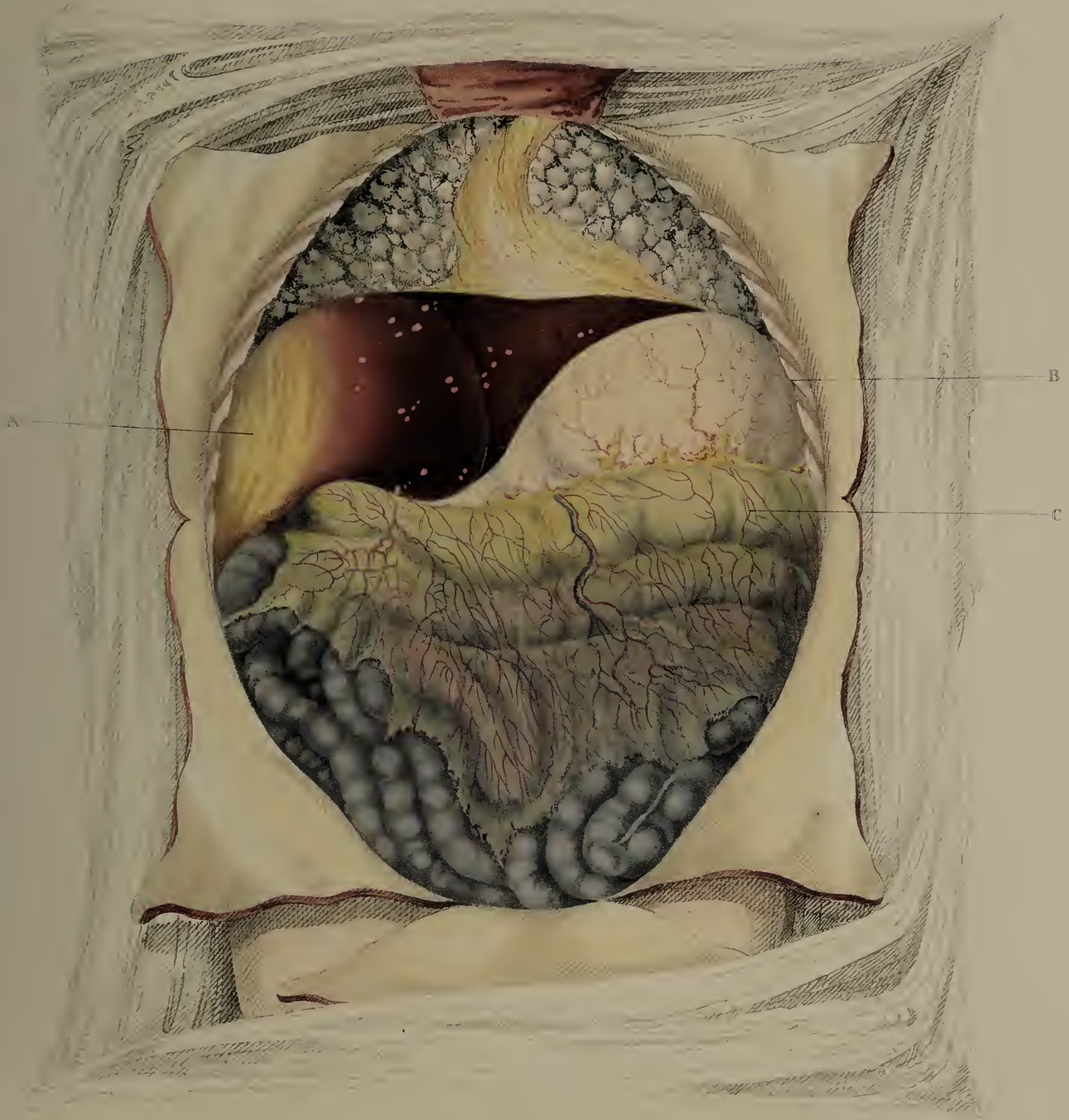
[See pp. 544—546.]

EXAMINATION, TWO HOURS AFTER DEATH.

Abscess of the Liver in situ, shewing the practicability of an Operation between the Ribs for its Cure.

- A. THE abscess in the right lobe; the surface and substance of the liver being studded with minute collections of matter, similar to those demonstrated in Plate IX.
- B. The stomach, distended and enlarged.
- C. The colon, covered by the omentum; the vessels of the latter filled with blood.

LYNCH'S CASE.



Shape of the right lobe of the Liver

DONOVAN'S CASE.

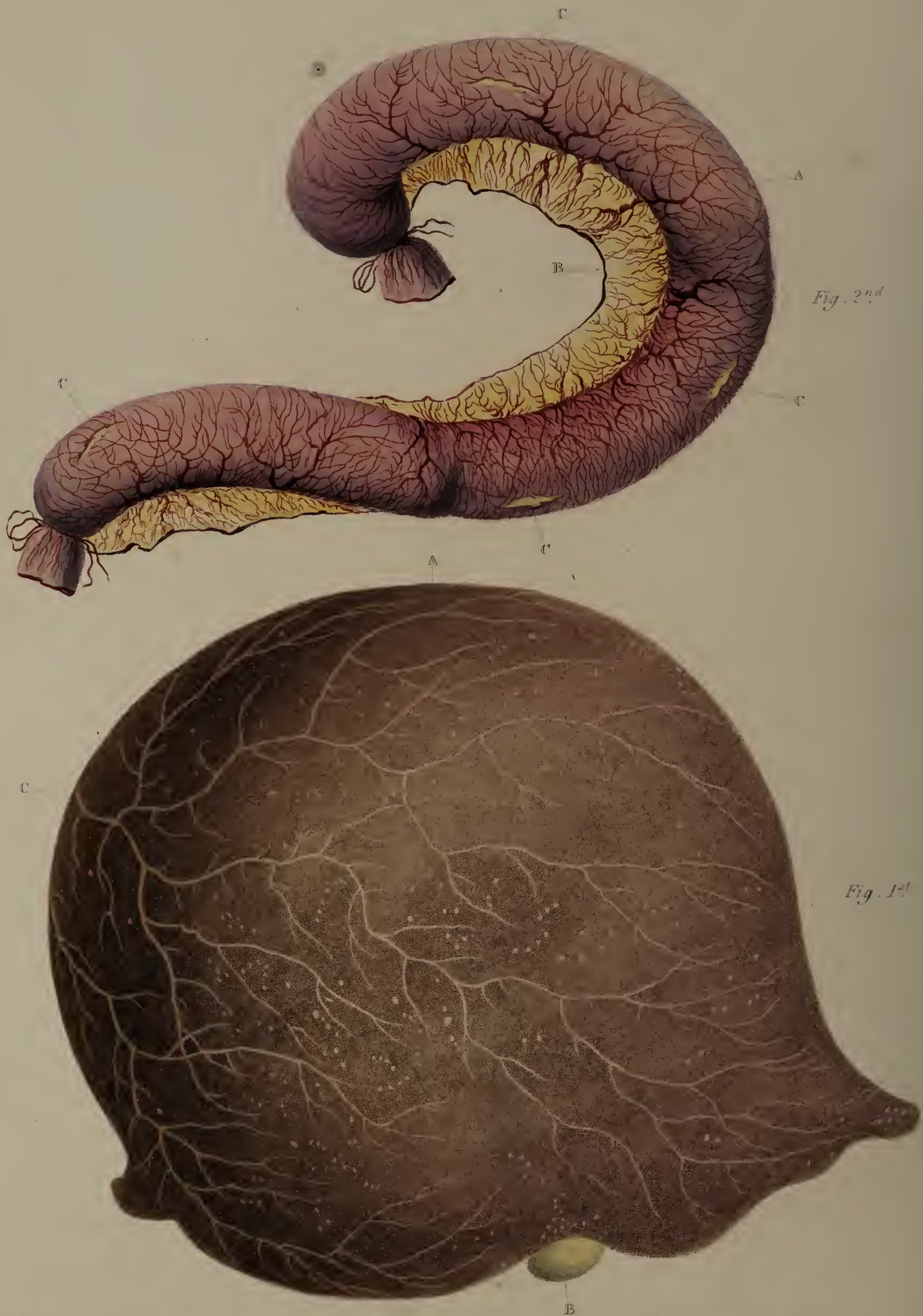


Fig. 1st Diseased Liver. — Fig. 2nd Inflamed and Ulcerated Intestine.

Engraved by J. Stewart, Sen^r

London, Published by Longman, Rees, Orme, Brown & Green 1827

PLATE XIII.

DONOVAN'S CASE.

[See pp. 486—89.]

EXAMINATION, THREE HOURS AFTER DEATH.

FIG. 1.— *View of the right Lobe of the Liver, greatly enlarged, and of a spheroid form.*

- A. THE superior part of the right lobe.
- B. The gall-bladder, filled with a pale straw-coloured bile.
- C. Trunk of one of the pale vessels running over the posterior portion of the liver, and ramifying in the surface of the right lobe.

The most remarkable appearances of this liver, were its pale, dusky pink colour; the still paler vessels ramified in its surface, and minute pale specks scattered over it; the great enlargement and softening of its structure; the nearly exsanguinous state of its blood-vessels; and the pale state of its internal substance, which was still more blanched than its surface. Although greatly softened, its organisation, as far as could be observed by the unassisted eye, was not otherwise diseased.

FIG. 2.— *The lower portion of the Ilium in the inflamed and inflated state found upon Examination.*

- A. The side of the intestine opposite the mesentery.
- B. Portion of the mesentery, much inflamed.
- C. C. C. C. Points where the internal ulceration had proceeded through all the coats of the intestine; the coagulable lymph thrown out upon the surface of the peritoneal coat, preventing the escape of the contained matters into the abdominal cavity.

PLATE XIV.

GORMAN'S CASE.

[See pp. 484—86.]

EXAMINATION, NINE HOURS AFTER DEATH.

FIG. 1.—*The Liver of an extremely small size and pale colour, with a Cicatrix in its Surface.*

A. THE cicatrix.

FIG. 2.—*Shewing the Appearance of the internal Structure of the Liver in the seat of the Cicatrix.*

A. The appearance of cicatrization, proceeding through the greater part of the internal structure of the organ.

Upon the surface of the liver were two prominences, which were very remarkable ; but the structure underneath was quite natural. The portion of the organ which had cicatrized was of a gristly or semi-cartilaginous firmness. The structure of the liver, although greatly diminished in bulk, was otherwise healthy.

These figures demonstrate, in a very interesting manner, the removal of purulent collections from the liver by means of absorption, and the restoration of the structure of the organ to a nearly healthy state, excepting a diminution of its size.

FIG. 3.—*The Colon in a nearly healthy state, but elongated, and its Sigmoid Flexure much displaced. (See p. 486; and for Observations on Displacement of the Colon, see Vol. II.)*

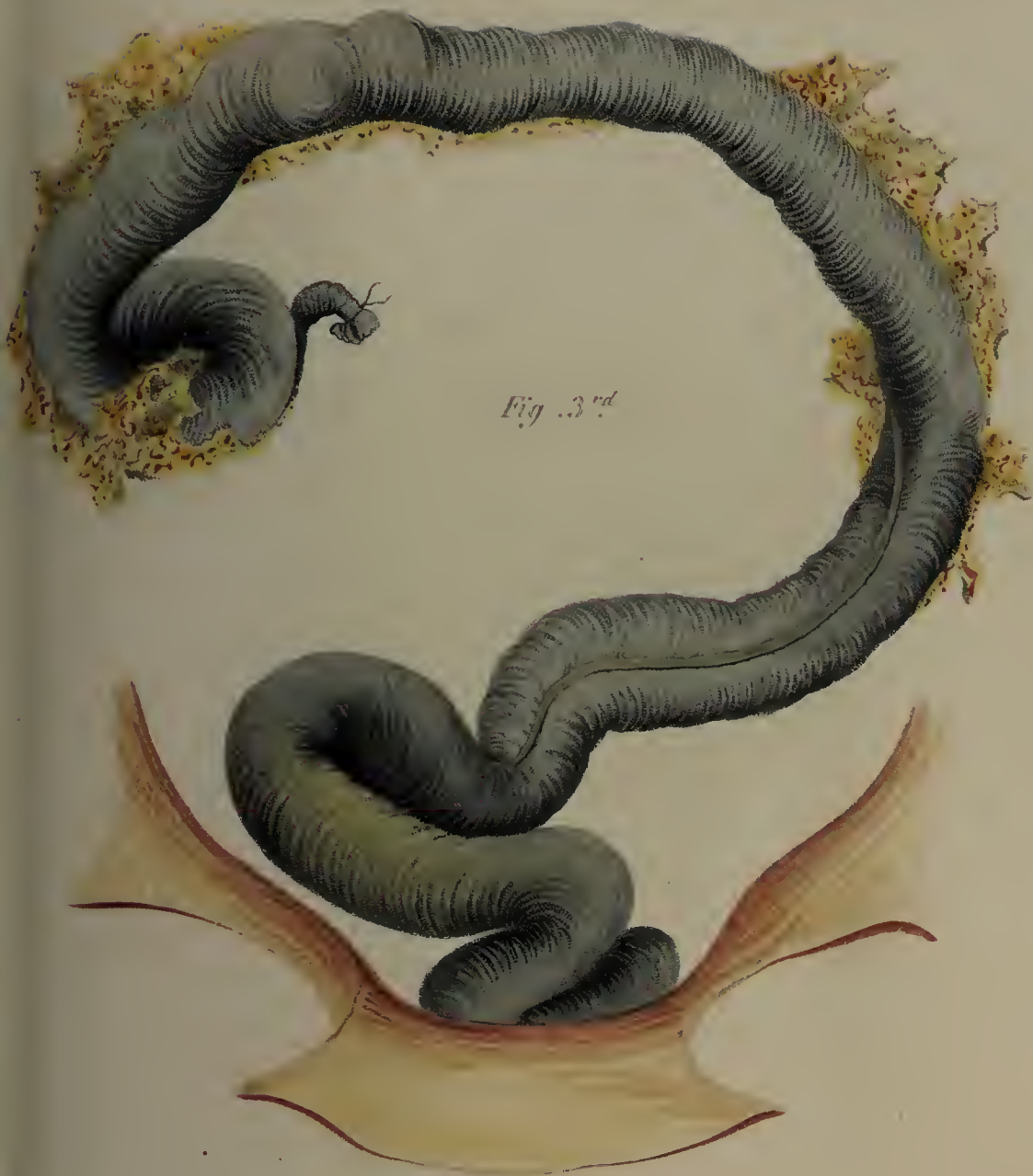


Fig. 3rd



Fig. 2nd



Fig. 1st

Fig. 1st & 2nd. Atrophy of the Liver with Cicatrix. Fig. 3rd Elongated Colon

Fig. 2nd



Fig. 1st. Remarkably Small Liver with Cicatrices. Fig. 2nd. Elongation of the Colon

Engraved by James B. Baile

PLATE XV.

HOYTE'S CASE.

[See pp. 498—502.]

EXAMINATION, SIX HOURS AFTER DEATH.

FIG. 1. — *Remarkably small Liver, with Cicatrices.*

- A. THE right lobe. — B. The gall-bladder.
- C. A large cicatrix on the convex surface of the right lobe.
- D. Small cicatrices dispersed through the surface of both lobes.
- E. The place where the liver adhered to the diaphragm.

Numerous radiated streaks proceeded from the cicatrices, particularly from the large one, over the surface of the organ. The internal structure of the liver was paler and harder than natural, especially immediately underneath the cicatrices. Its structure was not otherwise diseased. The liver weighed only one pound eleven ounces.

FIG. 2. — *The Colon much elongated and convoluted.*

The cæcum was situated low in the pelvic basin; the ascending colon much convoluted; the descending colon went low into the pelvis, then ascended directly up in front of the sacrum; and the rectum passed down into the pelvis, in front of the cæcum and on the right side of the pubis. (See the section on Displacement and Elongation of the Colon in Vol. II.)

PLATE XVI.

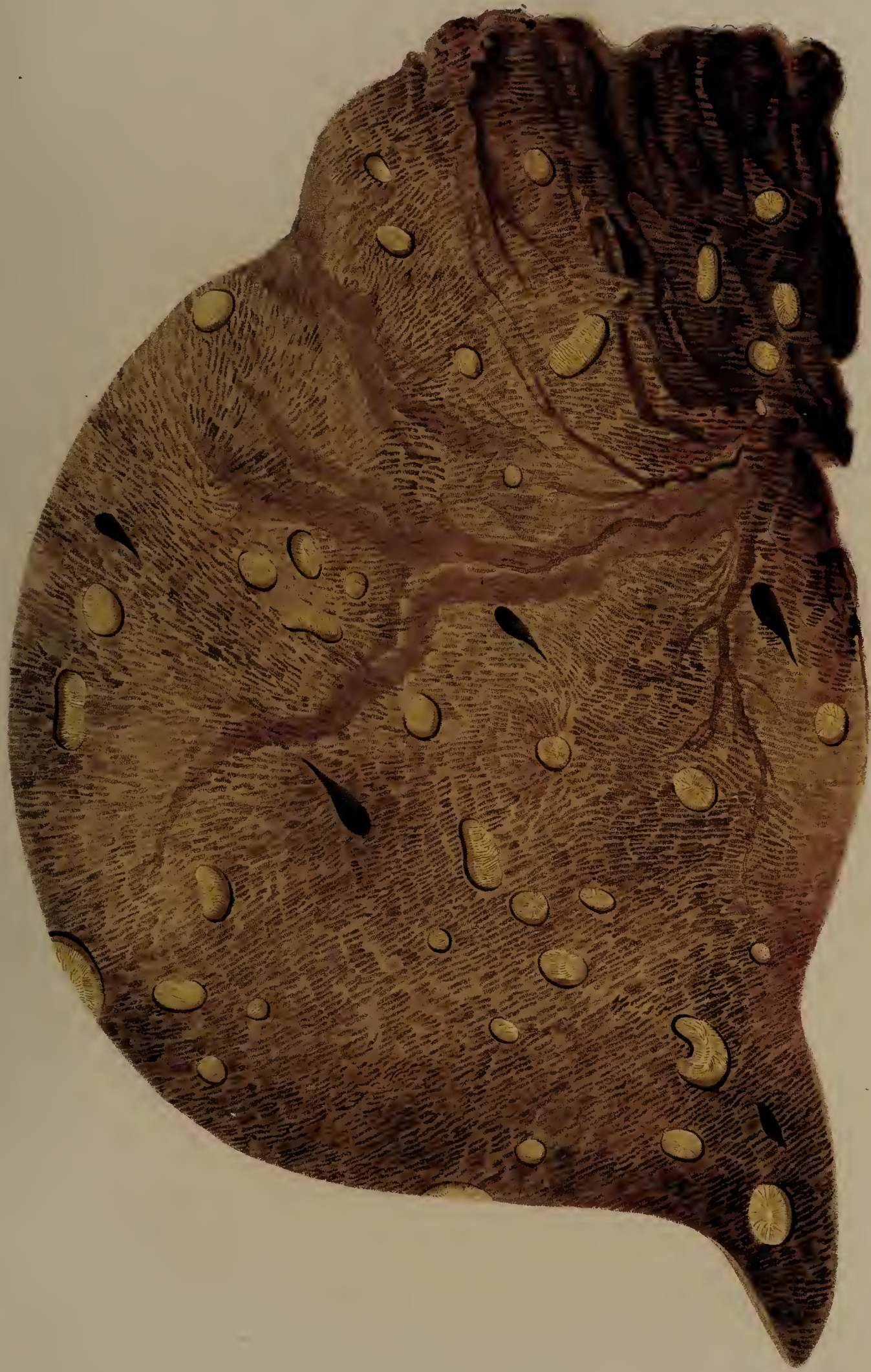
CAVANNAH'S CASE.

[See pp. 492—98.]

EXAMINATION, FIVE HOURS AFTER DEATH.

Transverse Section of the right Lobe of the Liver, shewing Tubercular Formations.

THE liver was much enlarged and indurated. Its surface and internal structure were studded with numerous spongy tubercles; some having a striated, others a radiated appearance, and almost in every instance scarcely filling the cavities in which they were lodged. The structure of the organ between the tubercles was of a lighter colour than usual.



Indurated and Tuberculated Liver.

Engraved by J. Stewart.

Fig. 3.

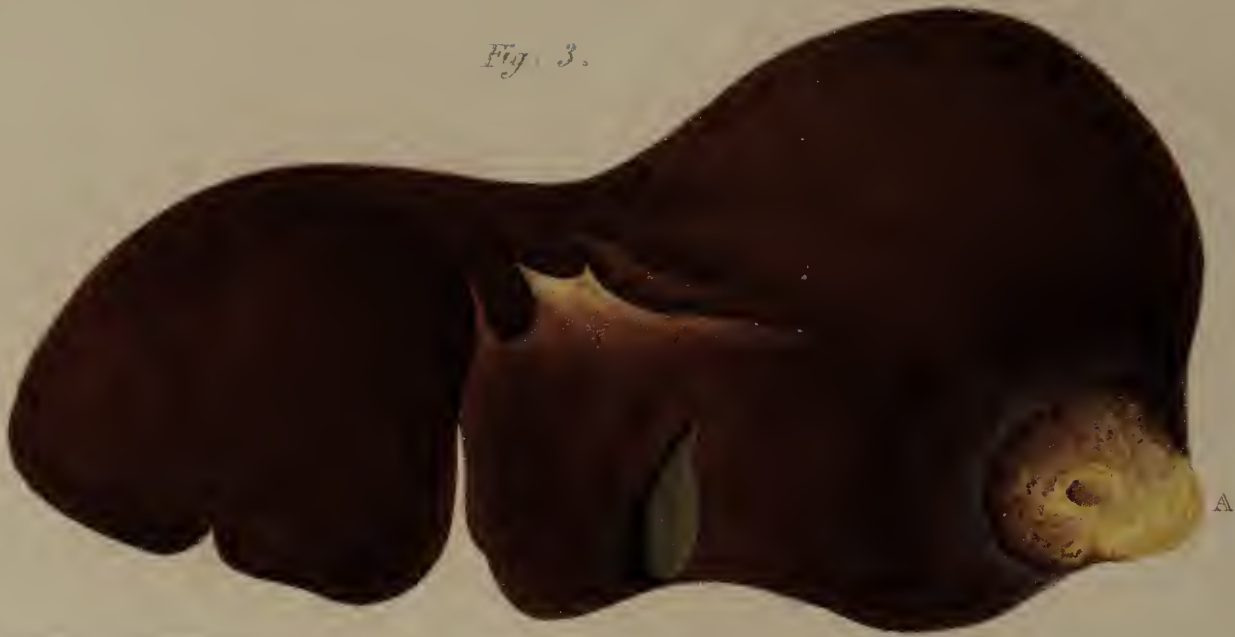


Fig. 1.

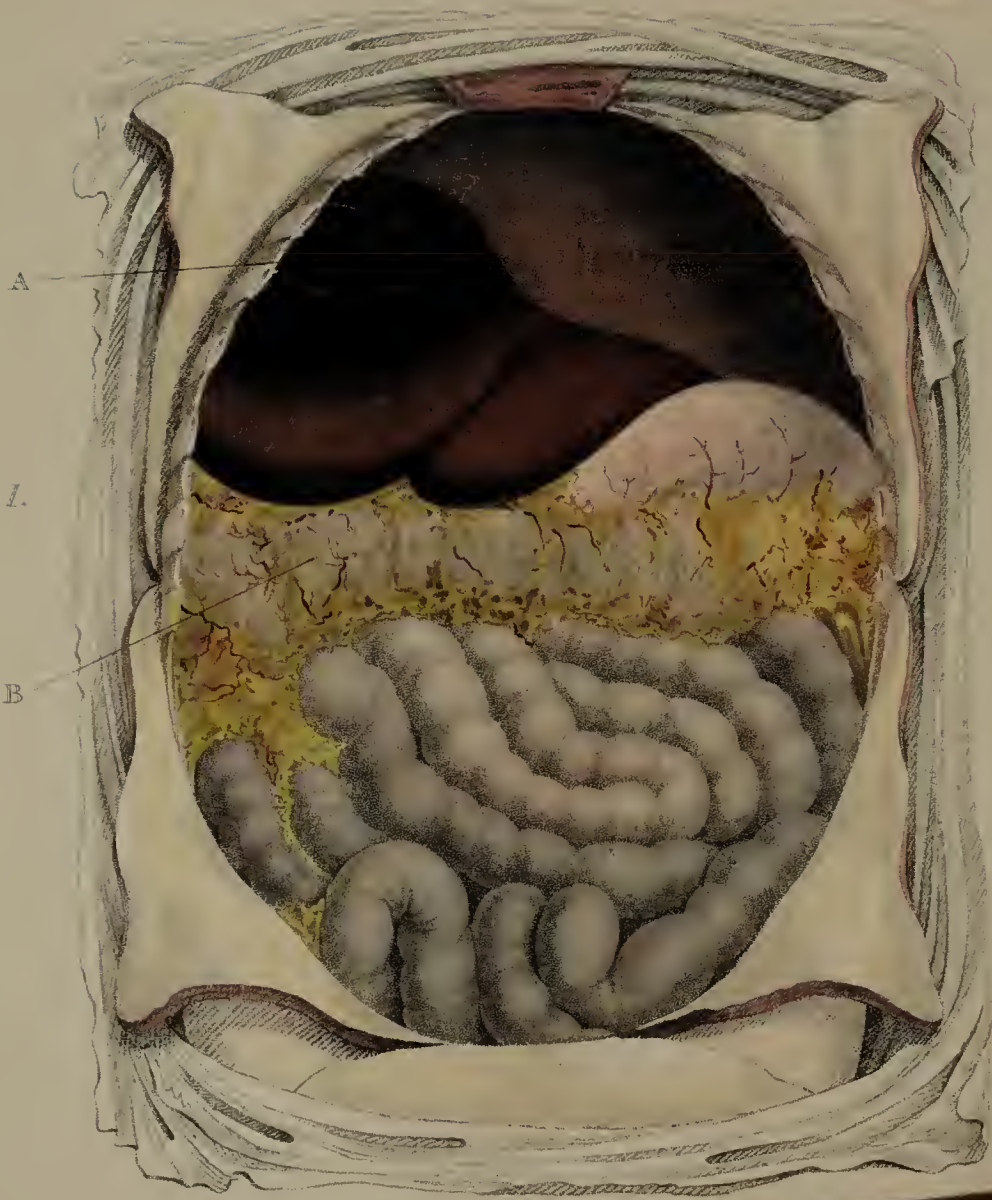
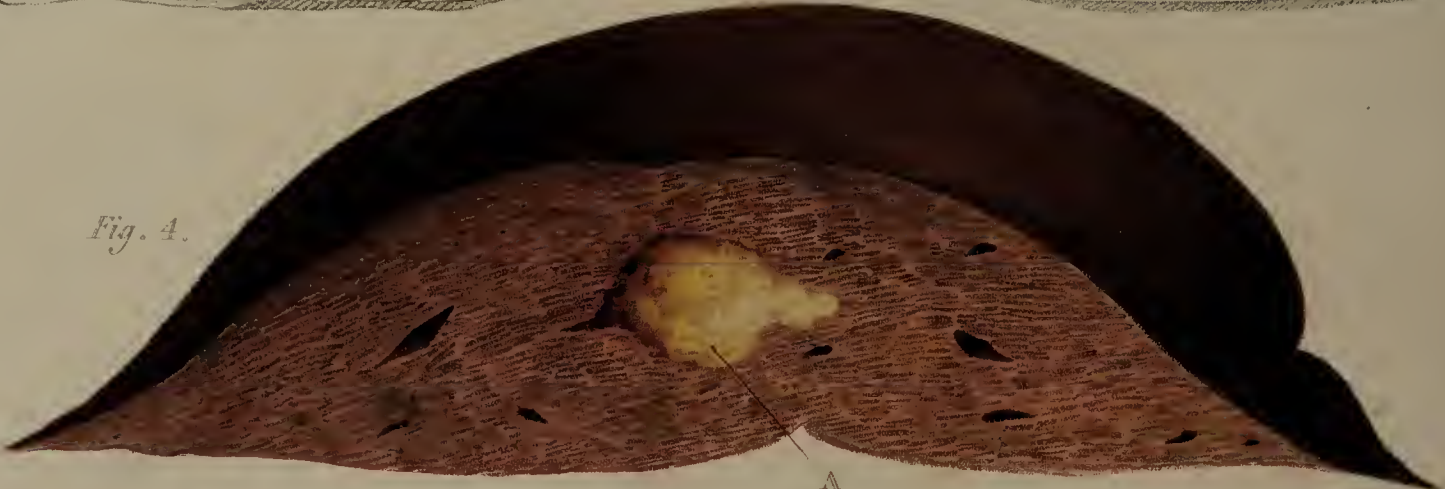


Fig. 2.



Fig. 4.



Congestion and Organic diseases of the Liver.

Engraved by Stewart Scott

London: Published by Longman, Rees, Orme, Brown & Green, 1827.

PLATE XVII.

RITSON'S CASE.

[See pp. 513—16.]

EXAMINATION TWO HOURS AFTER DEATH.

FIG. 1.—*Congestion and Organic Disease of the Liver, &c.*

- A. Great congestion, enlargement, and a purple colour of the right lobe of the liver.
- B. The omentum, inflamed, and collected around the colon.

P. ELLIOTT'S CASE.

[See pp. 512 and 513.]

EXAMINATION TWO HOURS AND A HALF AFTER DEATH.

FIG. 2.—*Congestion of the Liver, &c.*

- A. Great congestion, enlargement, and a black colour of the right lobe of the liver. The intestines distended with flatus.
- B. The omentum diseased, and collected around the cæcum and colon. The intestines distended with flatus.

GILDING'S CASE.

[See pp. 573—6.]

FIG. 3.—*Ulceration of the Liver, &c.*

- A. The lower portion of the right lobe of the liver excavated by an ulcer, the margin of which adhered to the right kidney. The liver was somewhat inflamed and much enlarged.

FIG. 4.—A section of the left lobe of the liver, shewing (A.) a small collection of purulent matter in its substance.—(See HAND'S CASE, pp. 539—41.)

PLATE XVIII.

SCHOFIELD'S CASE.

[See pp. 502—8.]

EXAMINATION FIVE HOURS AFTER DEATH.

FIG. 1.—*Part of the Liver, with Collections of thick, purulent-like Matter in its Surface.*

THE matter was of a cheese-like consistence, pale-yellow colour, and very slightly elevated the membrane covering the liver at the place of its deposition.

FIG. 2.—*Section of a part of the Liver, shewing the state of its internal Structure, and the character of the Matter deposited in it.*

The matter was similar to that deposited in the surface of the organ, was not contained in any visible cyst, and did not altogether fill the cavities in which it was lodged, probably owing to the absorption of its more fluid parts.

The liver was considerably enlarged, of a firmer texture, and more vascular, than natural.

SCHOFIELD'S CASE.

Fig. 1st



(Suppurated Tubercles on the Surface, and in the Substance (Fig. 2nd) of the Liver)

Engraved by J. Stewart, Junr.

London: Published by Longman, Rees, Orme, Brown, & Green, 1828.

ELLIOT'S CASE.



Completed by Elliot of the Liver

PLATE XIX.

ELLIOTT'S CASE.

[See pp. 679—83.]

Encysted Dropsy, with Hydatid of the Liver.

- A. The right lobe of the liver.
- B. The upper portion of the cyst, containing a portion of the accumulated fluid, which was of a pale straw-colour, with a very large hydatid floating in it.
- C. The opening made in the cyst, shewing the appearance of the fluid, and of the hydatid in the centre of the remaining portion.
- D. The lower portion of the cyst, somewhat collapsed, from the escape of a portion of the fluid, with large arterial vessels running through it.
- E. The gall-bladder, filled with green bile.

The surface of the liver was evidently inflamed, particularly near the cyst, and the internal structure of the organ softened and friable.

PLATE XX.

The Liver enlarged, granulated, or minutely lobulated, with Adhesions to the Diaphragm.

- A. The diaphragm adhering to the liver.
- B. D. Portions of the diaphragm.
- E. The suspensory ligament.
- C. A portion of the left lobe, divided in order to shew its structure.

The Drawing from which this Plate has been engraved was made from the liver of a person lately arrived from Europe, who died of dropsy soon after he joined his regiment. His disease must have existed for some time, even before he left Europe.



Engraved by Neale's

Transplanted Liver, with adhesions to the Diaphragm.

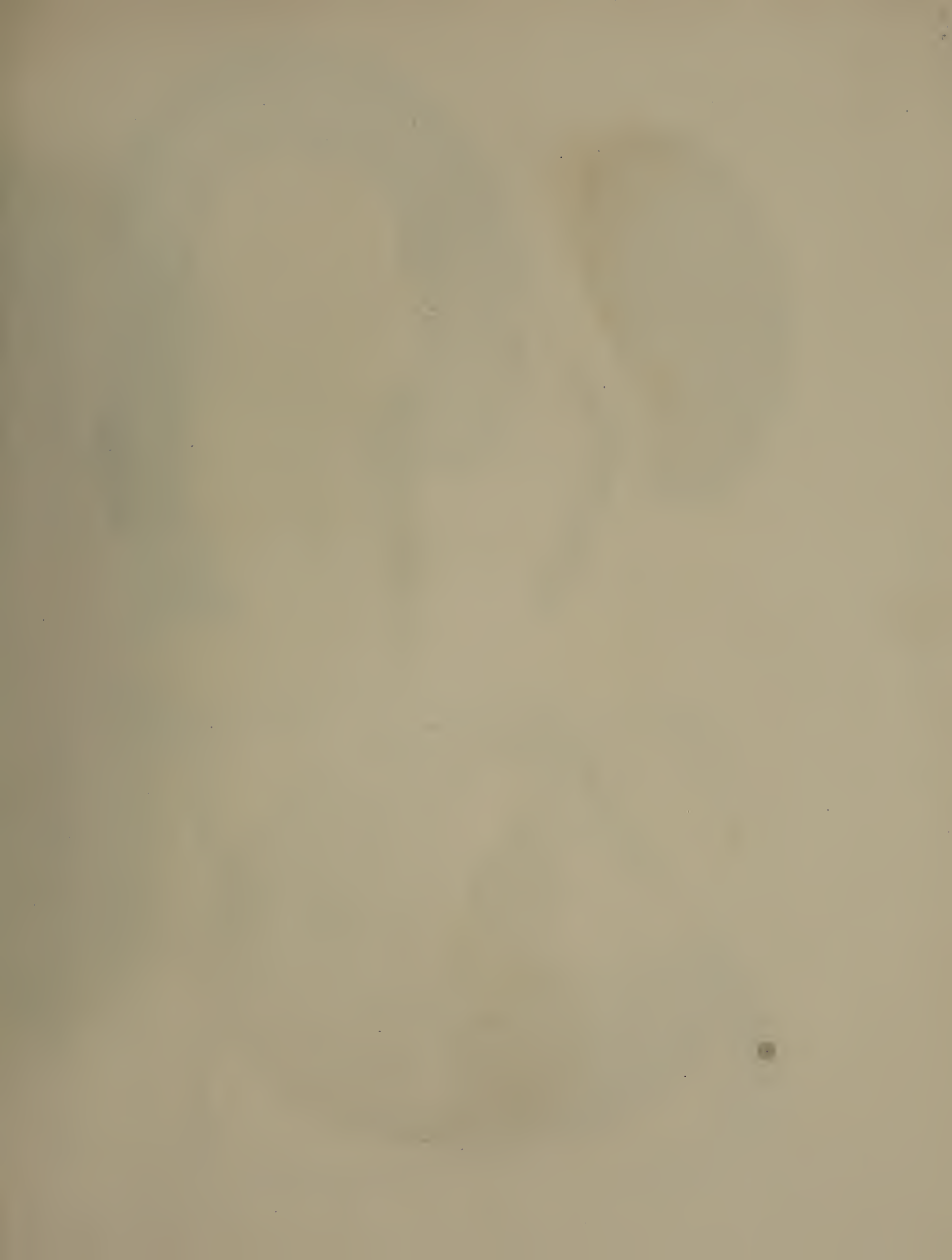


Fig. 1.



Fig. 1. Congestion of the Liver, & Intestines, Susceptible of the Placental.

Fig. 2.



Fig. 3.

Fig. 2. Congestion of the Placental.
Fig. 3. Dissection & Illustration of the Placenta.

Engraved by J. Stewart Scot.

London: Published by Longman, Brown, Green, & Co. 1827.

PLATE XXI.

MURBEY'S CASE.

[See Appendix, p. xxxvi.]

FIG. 1.—*Great Congestion and Enlargement of the Liver, with an extensive Intro-susception of the Ilium.*

- A. The right lobe of the liver, greatly congested, of a nearly black hue, and enlarged.
- B. The stomach.
- C. The left flexure of the colon.
- D. The intro-susception of the ilium.
- E. E. E. The flexures of the colon.

FIG. 2.—*The Gall-bladder, filled with a thick, dark-green, viscid bile, and its Duct obliterated.*

- A. The gall-bladder.
- B. The cystic duct, quite impervious, and reduced to a cord.
- C. The hepatic duct, divided.
- D. The common duct.

FIG. 3.—*The Colon laid open, shewing Inflammation, Ulceration, and Sphacelation of its internal Surface.*

- A. The ilium, near its entrance into the cæcum.
- B. The cæcum, inflamed, ulcerated, and sphacelated.
- C. Large ulcerated surface in the sigmoid flexure.
- D. The commencement of the rectum, also ulcerated.

E R R A T A.

PAGE 357, line 21 from top, *for* 32 *read* 28 leeches.

—— 364, — 7 ——— *for* mag. vitriol. \mathfrak{Z} ij. *read* \mathfrak{Z} iiij.

—— 365, — 12 ——— *for* pulse is quick and excited, *read* pulse quick ; tongue excited.

—— 373, — 15 ——— *for* April, *read* May.

—— 450, — 21 ——— *for* tongue rather furred, but clean, *read* tongue furred and excited.

—— 460, — 20 ——— *for* mist. salin. febrif. \mathfrak{Z} j. *read* \mathfrak{Z} vj.

—— 465, — 28 ——— *for* pulv. purg. \mathfrak{Z} j. *read* \mathfrak{Z} j.

—— 533, Note *, *for* Plate XII. *read* Plate X.

—— 548, line 7 from top, *dele* repet. enema purg.

—— 548, — 11 ——— *for* aquæ puræ, \mathfrak{Z} j. *read* \mathfrak{Z} j.

—— 610, last line but one, *for* aquæ ammon. \mathfrak{Z} j. *read* \mathfrak{Z} j.

☞ The Tinctura Amara, contained in the List of Formulæ at page 255, is exactly the same preparation as the “*Droque Amère*”—a medicine introduced into India by the Jesuits, and extremely serviceable in the complaints both of Natives and Europeans.

APPENDIX, No. I.

[See pp. 111—113.]

TABLES, shewing the Admissions and Deaths of the principal Diseases which occurred in the different Divisions of the Army under the BENGAL PRESIDENCY, from 1821 to 1825 inclusive, drawn up from the Official Returns of the MEDICAL BOARD OF CALCUTTA to the HONOURABLE THE COURT OF DIRECTORS.

MEDICAL RETURNS

FOR THE

PRESIDENCY DIVISION OF THE BENGAL ARMY,

FOR A PERIOD OF

FIVE YEARS, VIZ. FROM 1821 TO 1825 INCLUSIVE.

[See p. 111.]

YEARS.	SEASONS.	MONTHS.	Effective Strength.	Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhœa.			Per-Centage of Admissions.					Per-Centage of Deaths upon Admissions.					REMARKS.			
				Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.				
1821	Cold Season.	Jan. Feb. Nov. Dec.	1972	1	1	—	239	121	4	620	366	13	201	78	5	272	199	1	—	—	12½	21½	31½	10½	13½	—	17½	21½	2½	1½	1½	
1822	Ditto.	Ditto.	2171	14	8	2	244	137	7	692	423	31	177	77	2	190	109	3	—	—	11¼	31½	8½	8½	8½	14½	28	4½	1½	1½	1½	
1823	Ditto.	Ditto.	1185	26	14	3	297	171	—	474	303	10	107	45	3	137	94	2	2½	25	21¼	40	9	11½	11½	—	2½	2½	—	2½	1½	
1824	Ditto.	Ditto.	1709	13	10	1	365	249	14	573	356	15	128	56	—	148	96	4	—	—	21½	33½	7½	8½	8½	7½	3½	2½	—	2½	2½	
1825	Ditto.	Ditto.	1400	2	2	—	119	71	2	286	148	2	65	31	3	45	30	—	—	—	8½	20½	46	3½	3½	—	1½	½	4½	—	—	—
			8437	56	35	6	1264	749	27	2645	1596	71	678	287	13	792	528	10	3	15	31½	8	9½	9½	9½	107	24	2½	1½	1½	1½	1½
1821	Hot Season.	Mar. Apr. May, June.	1938	68	51	8	175	87	9	1047	690	16	272	128	11	245	165	2	3½	9	—	54	14	12½	12½	12½	5½	1½	4	4	4	4
1822	Ditto.	Ditto.	2366	25	14	7	170	97	8	726	438	6	295	79	6	184	113	1	1	7½	30½	30½	12½	7½	7½	28	4½	5½	2	2	5	
1823	Ditto.	Ditto.	1564	65	28	15	217	96	15	1535	889	23	116	50	3	135	93	—	4½	13½	98½	98½	7½	26	26	7½	1½	1½	2½	—	—	—
1824	Ditto.	Ditto.	1500	19	6	10	137	52	6	262	122	4	50	18	2	52	32	—	1½	9½	17½	3½	3½	3½	5½	4½	1½	4	4	—	—	—
1825	Ditto.	Ditto.	1400	16	10	—	210	97	15	1021	636	24	164	63	4	125	70	2	14	15	73	11½	9	9	—	74	2½	2½	2½	1½	1½	1½
			8768	193	109	40	909	429	53	4591	2775	73	897	338	26	741	473	5	2½	108	52½	10½	8½	8½	2½	5½	1½	1½	2½	2½	2½	2½
1821	Rainy Season.	July, Aug. Sept. Oct.	1862	15	11	1	291	141	17	881	594	14	232	88	7	280	179	—	—	—	15½	47½	12½	15	15	5½	5½	14	3	3	—	—
1822	Ditto.	Ditto.	1876	12	10	1	176	104	7	1072	777	42	89	34	2	129	94	—	—	9½	57½	47	68	68	8½	4	38	24	24	—	—	—
1823	Ditto.	Ditto.	1730	18	16	1	589	310	17	1777	1263	27	176	79	1	138	94	—	1	34	109½	10½	8	8	5½	28	1½	1½	½	½	—	—
1824	Ditto.	Ditto.	1840	12	4	8	637	238	51	1291	933	29	101	48	4	129	83	4	—	34½	70½	5½	7	66½	8	24	24	4	4	3½	3½	3½
1825	Ditto.	Ditto.	1400	24	13	7	320	187	16	1516	955	59	197	90	7	395	251	13	1½	22½	108½	14	28½	29½	5	38	5	38	3½	3½	3½	3½
			8708	81	54	18	2013	989	108	6537	4522	171	795	339	21	1071	701	17	18	23½	75½	9½	12½	12½	22½	5½	2½	2½	2½	2½	2½	2½

MEDICAL RETURNS
FOR THE
BERHAMPORE DIVISION OF THE BENGAL ARMY,

FOR A PERIOD OF
FOUR YEARS, VIZ. FROM 1821 TO 1824 INCLUSIVE.

[See p. 113.]

YEARS.	SEASONS.	MONTHS.	Effective Strength.	Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhœa.			Per-Centage of Admissions.					Per-Centage of Deaths upon Admissions.					REMARKS.
				Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.				
1821	Cold Season.	Jan. Feb. Nov. Dec.	820	—	—	—	34	18	3	170	126	5	27	13	2	49	34	—	—	4 $\frac{1}{2}$	20 $\frac{1}{2}$	3 $\frac{7}{8}$	6	—	8 $\frac{3}{4}$	2 $\frac{10}{10}$	7 $\frac{7}{8}$	—	
1822	Ditto.	Ditto.	1140	20	9	6	146	84	6	247	168	22	25	13	2	47	34	—	1 $\frac{1}{2}$	12 $\frac{1}{2}$	21 $\frac{3}{4}$	2 $\frac{1}{2}$	4 $\frac{1}{2}$	30	4 $\frac{1}{2}$	8 $\frac{10}{10}$	8	—	
1823	Ditto.	Ditto.	1263	10	6	2	97	66	7	339	223	17	20	8	2	38	28	2	$\frac{1}{2}$	7 $\frac{2}{3}$	26 $\frac{2}{3}$	3	3	20	7 $\frac{2}{3}$	5	10	54	
1824	Ditto.	Ditto.	1017	5	5	—	205	140	19	634	385	20	39	19	2	34	29	—	—	2 $\frac{1}{2}$	62 $\frac{1}{2}$	3 $\frac{7}{8}$	3 $\frac{1}{2}$	—	94	34	51	—	
			4240	35	20	8	432	308	35	1390	902	64	111	53	8	168	125	2	$\frac{5}{8}$	11 $\frac{1}{8}$	32 $\frac{2}{3}$	23	4	22 $\frac{2}{3}$	7 $\frac{2}{3}$	43	71	11	
1821	Hot Season.	Mar. Apr. May, June.	884	5	2	3	13	8	1	89	61	3	40	24	4	43	26	1	$\frac{3}{8}$	11 $\frac{1}{2}$	10	4 $\frac{1}{2}$	4 $\frac{5}{8}$	60	7 $\frac{7}{10}$	38	10	23	
1822	Ditto.	Ditto.	770	4	2	1	33	13	6	136	83	3	55	19	—	68	33	4	$\frac{5}{8}$	4 $\frac{1}{2}$	17 $\frac{2}{3}$	7 $\frac{1}{4}$	6 $\frac{3}{8}$	25	18 $\frac{1}{2}$	21	—	6	
1823	Ditto.	Ditto.	1390	21	11	7	100	55	6	175	115	5	39	21	1	60	51	—	1 $\frac{1}{2}$	7 $\frac{1}{2}$	12 $\frac{1}{4}$	2 $\frac{5}{8}$	4 $\frac{1}{2}$	30 $\frac{3}{4}$	28	28	—	—	
1824	Ditto.	Ditto.	319	5	5	—	54	29	5	120	72	2	21	15	—	49	36	—	1 $\frac{1}{8}$	17	37 $\frac{2}{3}$	6 $\frac{3}{8}$	15 $\frac{1}{2}$	—	94	13	—	—	
			3363	35	20	11	200	105	18	520	331	13	155	79	5	220	146	5	$\frac{10}{10}$	6	15 $\frac{1}{2}$	4 $\frac{3}{8}$	6 $\frac{3}{8}$	31 $\frac{1}{2}$	9	21	34	22	
1821	Rainy Season.	July, Aug. Sept. Oct.	851	3	2	—	39	19	3	245	147	5	58	26	2	76	47	2	$\frac{3}{8}$	4 $\frac{5}{8}$	28 $\frac{1}{2}$	6 $\frac{3}{8}$	9	—	7 $\frac{7}{10}$	2	3 $\frac{3}{4}$	23	
1822	Ditto.	Ditto.	900	19	8	9	91	61	7	278	163	19	30	14	—	48	38	2	2 $\frac{1}{2}$	10 $\frac{1}{2}$	30 $\frac{3}{8}$	3 $\frac{3}{8}$	53	47 $\frac{3}{8}$	7 $\frac{7}{10}$	7	—	46	
1823	Ditto.	Ditto.	1121	3	3	—	92	53	8	254	126	19	21	16	1	77	50	3	$\frac{7}{8}$	8 $\frac{2}{3}$	22 $\frac{2}{3}$	1 $\frac{1}{8}$	6 $\frac{3}{8}$	—	8 $\frac{7}{10}$	71	43	4	
1824	Ditto.	Ditto.	973	4	1	2	144	49	13	670	380	44	55	20	3	84	69	—	$\frac{1}{2}$	14 $\frac{1}{2}$	68 $\frac{1}{2}$	8 $\frac{3}{8}$	8 $\frac{3}{8}$	50	9	6 $\frac{5}{8}$	44	—	
			3845	29	14	11	366	182	31	1447	816	87	164	76	6	285	204	7	$\frac{5}{8}$	9 $\frac{3}{10}$	37 $\frac{10}{10}$	7 $\frac{9}{8}$	7 $\frac{9}{8}$	37 $\frac{10}{10}$	81	6	33	21	

MEDICAL RETURNS
FOR THE
DINAPORE DIVISION OF THE BENGAL ARMY,
FOR A PERIOD OF
FIVE YEARS, VIZ. FROM 1821 TO 1825 INCLUSIVE.

[See p. 117.]

YEARS.	SEASONS.	MONTHS.	Effective Strength.	Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhoea.			Per-Centage of Admissions.					Per-Centage of Deaths upon Admissions.					REMARKS.
				Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	
1821	Cold Season.	Jan. Feb. Nov. Dec.	852	6	3	1	113	69	5	156	102	6	26	10	1	49	34	—	—	13 $\frac{1}{4}$	18 $\frac{1}{2}$	3	5 $\frac{3}{4}$	16 $\frac{3}{4}$	4 $\frac{1}{2}$	4	—	—	
1822	Ditto.	Ditto.	870	3	2	—	93	34	6	85	55	—	21	10	—	29	16	—	—	10 $\frac{1}{2}$	9 $\frac{3}{4}$	2 $\frac{3}{4}$	3 $\frac{1}{2}$	—	—	—	—	—	
1823	Ditto.	Ditto.	926	16	8	1	254	122	21	229	157	5	24	15	3	57	37	—	1 $\frac{1}{4}$	27 $\frac{3}{4}$	2 $\frac{3}{4}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	8 $\frac{3}{4}$	2 $\frac{1}{2}$	12 $\frac{9}{16}$	—		
1824	Ditto.	Ditto.	760	4	4	—	321	154	26	131	77	8	23	6	1	33	19	—	—	42 $\frac{1}{4}$	17 $\frac{1}{2}$	3 $\frac{9}{16}$	4 $\frac{1}{2}$	—	8 $\frac{1}{10}$	6 $\frac{1}{4}$	3 $\frac{1}{4}$	—	
1825	Ditto.	Ditto.	404	5	2	—	20	11	3	6	3	1	16	9	1	1	1	—	—	1 $\frac{1}{2}$	1 $\frac{1}{2}$	4	—	—	15	16 $\frac{3}{4}$	6 $\frac{1}{4}$	—	
			3812	34	19	2	801	390	61	607	394	20	115	50	6	169	107	—	—	21	15 $\frac{3}{8}$	3	4 $\frac{1}{2}$	6	7 $\frac{3}{8}$	3 $\frac{1}{2}$	5 $\frac{1}{2}$	—	
1821	Hot Season.	Mar. Apr. May, June.	865	6	5	1	335	189	19	360	194	2	63	22	—	166	106	—	—	44 $\frac{1}{2}$	40 $\frac{1}{2}$	7 $\frac{7}{8}$	19 $\frac{1}{2}$	16 $\frac{3}{4}$	5	—	—	—	
1822	Ditto.	Ditto.	850	10	5	3	229	103	13	294	181	1	87	39	2	129	92	—	1 $\frac{1}{8}$	27	34 $\frac{3}{8}$	10 $\frac{1}{2}$	14	30	5 $\frac{3}{8}$	—	2 $\frac{7}{8}$	—	
1823	Ditto.	Ditto.	518	25	10	8	132	66	5	329	195	8	42	18	1	66	39	—	4 $\frac{6}{16}$	25 $\frac{1}{2}$	6 $\frac{1}{2}$	12 $\frac{1}{2}$	32	3 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{8}$	—		
1824	Ditto.	Ditto.	691	9	5	1	295	172	30	190	140	4	44	21	2	22	13	—	1 $\frac{3}{10}$	4 $\frac{1}{4}$	27 $\frac{5}{8}$	6 $\frac{3}{8}$	3 $\frac{1}{4}$	11	10 $\frac{1}{8}$	2 $\frac{1}{2}$	4 $\frac{3}{8}$	—	
1825	Ditto.	Ditto.	597	4	—	4	138	82	15	128	79	5	64	31	2	—	—	—	—	23 $\frac{1}{2}$	21 $\frac{1}{4}$	10 $\frac{9}{16}$	—	100	10 $\frac{9}{16}$	3 $\frac{3}{8}$	3 $\frac{3}{8}$	—	
			3521	54	25	17	1179	617	82	1301	789	20	300	131	7	383	250	—	1 $\frac{1}{2}$	33 $\frac{1}{2}$	37	6 $\frac{3}{8}$	10 $\frac{10}{16}$	31 $\frac{1}{2}$	7	1 $\frac{1}{2}$	2 $\frac{1}{2}$	—	
1821	Rainy Season.	July, Aug. Sept. Oct.	882	5	4	1	296	171	16	343	217	5	72	32	3	69	54	—	—	33 $\frac{1}{2}$	38 $\frac{3}{8}$	8 $\frac{1}{2}$	7 $\frac{9}{8}$	20	5 $\frac{1}{8}$	1 $\frac{1}{2}$	4 $\frac{1}{4}$	—	
1822	Ditto.	Ditto.	876	—	—	—	97	33	12	173	110	9	67	33	6	52	44	—	—	11 $\frac{1}{2}$	197	7 $\frac{9}{16}$	5 $\frac{5}{8}$	—	12 $\frac{3}{8}$	5 $\frac{1}{4}$	9	—	
1823	Ditto.	Ditto.	1114	29	12	9	307	143	23	754	463	24	62	37	—	77	51	1	2 $\frac{6}{10}$	27 $\frac{3}{8}$	67 $\frac{3}{8}$	5 $\frac{5}{8}$	7	31	9 $\frac{1}{4}$	3 $\frac{1}{8}$	—	1 $\frac{3}{4}$	
1824	Ditto.	Ditto.	365	1	—	1	175	94	18	185	122	7	34	13	3	—	—	—	—	47 $\frac{10}{16}$	50 $\frac{5}{8}$	9 $\frac{3}{8}$	—	100	10 $\frac{1}{2}$	3 $\frac{1}{4}$	8 $\frac{3}{8}$	—	
1825	Ditto.	Ditto.	563	1	—	1	91	54	12	563	422	3	37	13	2	6	2	1	—	16 $\frac{1}{2}$	100	6 $\frac{5}{8}$	1	100	13 $\frac{1}{4}$	5 $\frac{1}{8}$	16 $\frac{1}{4}$	—	
			3800	36	16	12	966	495	86	2018	1334	48	272	128	14	204	151	2	1 $\frac{9}{16}$	25 $\frac{1}{2}$	53 $\frac{1}{2}$	7 $\frac{1}{2}$	5 $\frac{1}{2}$	33 $\frac{1}{2}$	8 $\frac{1}{16}$	2 $\frac{1}{2}$	5 $\frac{1}{4}$	1	

MEDICAL RETURNS FOR THE BENARES DIVISION OF THE BENGAL ARMY,

FOR A PERIOD OF
FIVE YEARS, VIZ. FROM 1821 TO 1825 INCLUSIVE.
[See p. 120.]

YEARS.	SEASONS.	MONTHS.	Effective Strength.	Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhoea.			Per-Centage of Admissions.					Per-Centage of Deaths upon Admissions.					REMARKS.
				Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.				
1821	Cold Season.	Jan. Feb. Nov. Dec.	1671	3	1	1	53	28	4	194	116	10	12	5	—	24	16	—	—	3½	113	—	1½	33½	7½	5½	—	—	
1822		Ditto.	1327	1	1	—	58	31	6	205	153	4	36	11	2	51	36	1	—	4½	15½	3½	3½	—	10½	1½	5½	2	
1823		Ditto.	1290	3	1	2	69	37	2	143	108	3	86	39	3	38	26	—	—	5½	11	6½	2½	66½	2½	2½	3½	—	
1824		Ditto.	767	1	—	1	55	30	2	190	106	4	47	16	—	16	11	—	—	7½	24½	6½	2½	100	3½	2½	—	—	
1825	Ditto.	Ditto.	725	—	—	—	20	13	—	69	44	—	6	3	—	5	2	—	—	2½	9½	—	—	—	—	—	—	—	
			5780	8	3	4	255	139	14	801	527	21	187	74	5	134	91	1	—	4½	18	3½	2½	50	5½	2½	2½	3	
1821	Hot Season.	Mar. Apr. May, June.	1223	7	3	1	62	34	4	166	119	2	13	15	—	46	36	—	—	5	13½	1	3½	14½	6½	1½	—	—	
1822		Ditto.	1313	13	5	4	42	27	1	183	128	2	21	13	—	37	26	1	1	3½	13½	1½	2½	30½	2½	1½	—	2½	
1823		Ditto.	1279	6	6	—	72	34	4	164	110	1	115	25	1	53	38	—	—	5½	12½	9	4½	—	5½	3	—	—	
1824		Ditto.	1024	8	7	—	35	23	1	212	144	5	127	62	1	53	36	—	—	3½	20½	12½	5½	—	2½	2½	4	—	
1825	Ditto.	Ditto.	762	4	2	—	39	23	2	178	93	4	15	7	—	7	4	—	—	5½	23½	2	1	—	5½	2½	—	—	
			5601	38	23	5	250	141	12	903	594	14	291	122	2	196	140	1	—	4½	16½	5½	3½	13½	4½	1½	—	½	
1821	Rainy Season.	July, Aug. Sept. Oct.	1324	5	4	—	101	57	7	314	201	11	8	4	1	67	49	1	—	7½	23½	—	5	—	7	3½	12½	1½	
1822		Ditto.	1321	8	6	1	100	61	4	292	208	7	15	9	1	59	41	1	—	7½	22½	1½	4½	—	4	2½	6½	1½	
1823		Ditto.	1272	5	2	1	106	41	3	276	179	4	126	43	3	63	44	—	—	8½	21½	9½	4½	20	3	1½	2½	—	
1824		Ditto.	353	1	—	1	46	28	3	62	40	2	10	5	—	10	2	—	—	13	17½	2½	2½	100	6½	3½	—	—	
1825	Ditto.	Ditto.	991	—	—	—	105	55	2	777	572	6	34	18	2	15	9	1	—	10½	77½	3½	1½	—	2	7	5½	6½	
			5261	19	12	3	458	242	19	1721	1200	30	193	79	7	214	145	3	—	8½	32½	3½	4	15½	4½	1½	3½	1½	

MEDICAL RETURNS
FOR THE
CAWNPORE DIVISION OF THE BENGAL ARMY,
FOR A PERIOD OF
FIVE YEARS, VIZ. FROM 1821 TO 1825 INCLUSIVE.
[See p. 122.]

YEARS.	SEASONS.	MONTHS.	Effective Strength.	Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhoea.			Per-Centage of Admissions.					Per-Centage of Deaths upon Admissions.					REMARKS.
				Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.				
1821	Cold Season.	Jan. Feb. Nov. Dec.	1661	1	1	—	156	101	2	353	228	21	46	24	—	24	14	2	—	—	9 ³ / ₄	21 ² / ₄	27 ² / ₄	1 ¹ / ₂	—	1 ¹ / ₂	—	8 ¹ / ₂	
1822	Ditto.	Ditto.	1168	—	—	—	120	66	5	407	300	6	21	16	—	45	25	1	—	—	10 ¹ / ₄	35	17 ¹ / ₂	3 ³ / ₈	—	4 ¹ / ₂	—	2 ¹ / ₄	
1823	Ditto.	Ditto.	1789	1	1	—	174	101	7	419	265	5	50	16	9	142	101	2	—	—	97 ² / ₈	23 ³ / ₈	24	8	—	4	1 ¹ / ₂	1 ¹ / ₂	
1824	Ditto.	Ditto.	2821	6	4	2	92	50	4	521	366	2	75	27	2	96	52	1	4	33 ³ / ₈	3 ¹ / ₄	18 ² / ₄	2 ³ / ₈	3 ³ / ₈	33 ³ / ₈	4 ¹ / ₂	8	2 ³ / ₈	
1825	Ditto.	Ditto.	1759	—	—	—	45	24	2	131	94	—	54	29	—	43	29	3	—	—	2 ⁵ / ₈	7 ³ / ₈	3	2 ¹ / ₄	—	4 ¹ / ₂	—	7	
			9198	8	6	2	587	342	20	1831	1253	34	246	112	11	350	221	9	1 ¹ / ₂	6 ³ / ₈	20	2 ³ / ₈	3 ¹ / ₄	3 ¹ / ₄	25	3 ³ / ₈	1 ¹ / ₂	2 ⁵ / ₈	
1821	Hot Season.	Mar. Apr. May, June.	1791	98	42	23	233	113	13	578	321	12	66	24	2	47	31	—	5 ¹ / ₂	13	30 ¹ / ₄	3 ³ / ₈	2 ³ / ₈	2 ³ / ₈	23 ¹ / ₂	5 ³ / ₈	2 ¹ / ₂	3	
1822	Ditto.	Ditto.	953	—	—	—	35	16	1	251	151	17	20	8	—	30	18	1	—	—	3 ³ / ₈	26 ¹ / ₄	2 ¹ / ₂	3 ¹ / ₈	—	6 ¹ / ₄	—	3 ¹ / ₂	
1823	Ditto.	Ditto.	2171	26	13	2	271	237	11	865	522	11	87	40	1	129	127	—	1 ¹ / ₂	12 ¹ / ₂	40	4	6	8	4	1 ¹ / ₂	1 ¹ / ₂	—	
1824	Ditto.	Ditto.	1918	18	9	2	177	96	6	747	510	10	97	32	1	180	117	1	1 ¹ / ₂	9 ¹ / ₂	38 ⁹ / ₁₀	5	9 ² / ₈	11 ¹ / ₂	3 ³ / ₈	1 ¹ / ₂	1	3	
1825	Ditto.	Ditto.	1999	11	8	—	121	62	7	483	347	2	171	57	1	135	89	1	1 ¹ / ₂	6	24 ¹ / ₂	8 ¹ / ₂	6 ¹ / ₂	—	57 ¹ / ₈	4	3	—	
			8832	153	72	27	837	424	38	2924	1851	52	441	161	5	521	382	3	17 ¹ / ₂	9 ¹ / ₂	33 ¹ / ₂	4	6	18	4 ¹ / ₂	17 ¹ / ₂	14	5	
1821	Rainy Season.	July, Aug. Sept. Oct.	1732	53	26	15	390	227	11	878	584	20	64	33	1	67	44	—	3	23 ¹ / ₈	507	3 ³ / ₈	3 ¹ / ₂	3 ¹ / ₂	28 ¹ / ₂	24	2 ¹ / ₂	1 ¹ / ₂	
1822	Ditto.	Ditto.	1566	22	12	5	261	149	14	540	327	4	64	35	1	108	79	2	1 ¹ / ₂	16 ³ / ₄	34 ³ / ₈	4 ¹ / ₁₀	7	227	5 ³ / ₈	5 ¹ / ₄	1 ¹ / ₂	2	
1823	Ditto.	Ditto.	2460	30	10	13	375	197	8	920	629	8	118	44	9	225	154	4	1 ¹ / ₂	15 ¹ / ₄	37 ² / ₈	4 ³ / ₄	94	43 ¹ / ₂	24	7 ¹ / ₂	1 ¹ / ₂	—	
1824	Ditto.	Ditto.	1719	20	11	4	230	116	7	792	514	9	129	59	—	168	124	4	1 ¹ / ₂	13 ³ / ₈	46 ³ / ₈	7 ¹ / ₂	97	20	3	1 ¹ / ₂	—	2 ¹ / ₂	
1825	Ditto.	Ditto.	2100	10	7	1	241	126	13	2398	1893	17	153	82	6	236	152	2	1 ¹ / ₂	11 ¹ / ₂	123 ³ / ₄	7 ¹ / ₂	11 ¹ / ₄	10	5 ³ / ₈	3	3 ¹ / ₁₀	8	
			9577	135	66	38	1497	815	53	5528	3947	58	528	253	17	804	553	12	1 ¹ / ₂	15 ³ / ₈	577	5 ⁵ / ₈	8 ³ / ₈	284	3 ⁵ / ₈	1	3 ³ / ₈	1 ¹ / ₁₀	

MEDICAL RETURNS
FOR THE
MERRUT DIVISION OF THE BENGAL ARMY

FOR A PERIOD OF
FIVE YEARS, VIZ. FROM 1821 TO 1825 INCLUSIVE.
[See p. 126.]

YEARS.	SEASONS.	MONTHS.	Effective Strength.	Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhoea.			Per-Centage of Admissions.					Per-Centage of Deaths upon Admissions.					REMARKS.
				Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	
1821	Cold Season.	Jan. Feb. Nov. Dec.	1960	2	1	—	190	104	5	231	131	6	60	22	2	29	15	2	—	9 ⁷ / ₁₀	11 ⁷ / ₁₀	3	1 ¹ / ₂	—	—	2 ³ / ₁₀	3 ¹ / ₅	7	
1822		Ditto.	1866	1	—	—	182	101	5	206	131	2	35	18	—	35	19	1	—	9 ⁷ / ₁₀	17 ⁴ / ₁₀	1 ⁸ / ₁₀	1 ⁸ / ₁₀	—	2 ⁷ / ₁₀	1	—	2 ⁷ / ₁₀	
1823		Ditto.	2068	2	2	—	203	121	7	335	237	1	74	34	2	38	18	—	—	9 ⁴ / ₁₀	16 ⁴ / ₁₀	3 ³ / ₁₀	1 ⁸ / ₁₀	—	3 ¹ / ₂	1 ¹ / ₃	—	2 ³ / ₁₀	
1824		Ditto.	2151	2	—	2	191	116	2	202	123	5	78	24	3	22	16	—	—	8 ¹⁰ / ₁₀	9 ⁸ / ₁₀	3 ⁶ / ₁₀	1	100	1	2 ¹ / ₂	3 ⁸ / ₁₀	—	
1825		Ditto.	2130	—	—	—	85	55	—	73	51	—	57	17	1	6	6	—	—	4	3 ⁴ / ₁₀	2 ⁹ / ₁₀	—	—	—	—	—	1 ⁷ / ₁₀	—
			10175	7	3	2	851	497	19	1047	673	14	304	115	8	130	74	3	¹ / ₄	8 ¹ / ₃	10 ¹ / ₃	3	1 ⁴ / ₄	28 ⁴ / ₄	2 ⁹ / ₁₀	1 ¹ / ₃	2 ³ / ₁₀	2 ¹ / ₃	
1821	Hot Season.	Mar. Apr. May, June.	2069	—	—	—	167	80	5	325	207	4	77	25	1	16	7	—	—	8	16	3 ⁷ / ₁₀	—	—	3	1 ⁷ / ₁₀	—	—	
1822		Ditto.	1986	2	2	—	177	80	5	336	200	2	64	23	—	52	24	1	—	9	16 ⁸ / ₁₀	3 ² / ₁₀	2 ⁹ / ₁₀	—	2 ⁹ / ₁₀	³ / ₅	—	2	
1823		Ditto.	2090	22	10	5	136	67	2	387	193	5	79	26	2	71	33	2	1	6 ¹ / ₂	18 ³ / ₁₀	3 ⁷ / ₁₀	3 ⁸ / ₁₀	22 ⁶ / ₁₀	1 ¹ / ₂	1 ¹⁰ / ₁₀	2 ⁵ / ₁₀	2 ¹ / ₅	
1824		Ditto.	2331	10	7	1	356	195	7	433	250	6	143	46	1	76	47	—	—	15 ⁸ / ₁₀	18 ³ / ₁₀	6 ³ / ₁₀	3 ⁷ / ₁₀	10	2.	1 ⁸ / ₁₀	7 ¹⁰ / ₁₀	—	
1825		Ditto.	2022	10	5	1	156	103	2	242	151	4	114	52	1	25	15	—	—	7 ³ / ₁₀	11 ¹⁰ / ₁₀	5 ⁹ / ₁₀	1 ² / ₁₀	10	1 ⁷ / ₁₀	1 ⁸ / ₁₀	⁸ / ₈	—	
			10498	44	24	7	992	525	21	1723	1001	21	477	172	5	240	126	3	¹ / ₅	9 ¹ / ₂	16 ¹ / ₁₀	4 ¹ / ₂	2 ¹ / ₃	16	2 ¹ / ₁₀	1 ¹ / ₅	1	1 ¹ / ₄	
1821	Rainy Season.	July, Aug. Sept. Oct.	2000	21	12	1	298	142	16	544	323	13	72	27	2	50	36	1	1	14 ¹⁰ / ₁₀	27 ¹⁰ / ₁₀	3 ¹⁰ / ₁₀	2 ¹ / ₂	5	5 ⁶ / ₁₀	2 ³ / ₁₀	2		
1822		Ditto.	1875	3	1	1	260	136	7	391	220	12	67	31	—	92	49	1	—	13 ⁸ / ₁₀	20 ⁸ / ₁₀	3 ⁸ / ₁₀	4 ¹⁰ / ₁₀	33 ¹ / ₁₀	2 ² / ₁₀	3	—	1 ¹ / ₁	
1823		Ditto.	2131	8	4	2	250	171	6	918	613	8	101	43	1	88	48	2	—	11 ⁷ / ₁₀	43	4 ⁷ / ₁₀	4 ⁸ / ₁₀	25	2 ² / ₁₀	⁸ / ₈	1	2 ³ / ₁₁	
1824		Ditto.	2192	5	4	1	252	153	4	383	206	7	172	72	4	69	44	2	—	11 ⁵ / ₁₀	17 ¹ / ₁₀	8 ³ / ₁₀	3 ⁸ / ₁₀	20	1 ³ / ₁₀	1 ⁴ / ₁₀	2 ¹ / ₃	3	
1825		Ditto.	2100	—	—	—	347	194	5	401	241	12	201	53	4	45	21	—	—	16 ⁸ / ₁₀	19 ¹⁰ / ₁₀	2 ⁸ / ₁₀	2 ⁴ / ₁₀	—	1 ¹ / ₃	3	2	—	
			10298	37	21	5	1407	796	38	2637	1603	52	613	226	11	344	198	6	³ / ₈	13 ³ / ₁₀	25 ⁶ / ₁₀	6	3 ¹ / ₃	13 ¹ / ₂	2 ⁷ / ₁₀	2	1 ⁴ / ₁		

MEDICAL RETURNS

FOR THE

MALWA DISTRICT OF THE BENGAL ARMY,

FOR A PERIOD OF

FOUR YEARS, VIZ. FROM 1821 TO 1824 INCLUSIVE.

[See p. 129.]

YEARS.	SEASONS.	MONTHS.	Effective Strength.	Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhoea.			Per-Centage of Admissions.				Per-Centage of Deaths upon Admissions.				REMARKS.		
				Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhoea.	Cholera.	Dysentery.	Fever.		Hepatitis.	Diarrhoea.
1821	Cold Season.	Jan. Feb. Nov. Dec.	203	—	—	—	41	24	2	101	67	2	7	5	—	12	7	1	—	—	—	—	—	5	2	—	—	—	8½
1822	Ditto.	Ditto.	194	1	1	—	46	14	6	68	39	1	1	—	—	3	—	1	—	—	—	—	13	1½	—	—	—	33½	
1823	Ditto.	Ditto.	228	1	1	—	23	13	1	58	32	3	9	6	—	4	3	1	—	—	—	—	4½	5½	—	—	—	25	
1824	Ditto.	Ditto.	287	—	—	—	—	—	—	51	31	3	12	6	—	4	—	—	—	—	—	—	—	6	—	—	—	—	
			912	2	2	—	110	51	9	278	169	9	29	17	—	23	10	3	—	—	—	—	8½	3½	—	—	—	13	
1821	Hot Season.	Mar. April, May, June.	240	—	—	—	9	2	1	174	94	2	3	1	—	15	3	—	—	—	—	—	—	11	1½	—	—	—	—
1822	Ditto.	Ditto.	200	—	—	—	47	28	1	48	34	2	9	4	1	—	—	—	—	—	—	—	—	2½	4	11	—	—	
1823	Ditto.	Ditto.	274	—	—	—	16	10	2	90	57	3	9	3	—	2	2	—	—	—	—	—	—	12½	3½	—	—	—	
1824	Ditto.	Ditto.	303	—	—	—	6	5	—	50	27	—	3	3	—	6	3	—	—	—	—	—	—	—	—	—	—	—	
			1017	—	—	—	78	45	4	362	212	7	24	11	1	23	8	—	—	—	—	—	5½	1½	—	—	—	—	
1821	Rainy Season.	July, Aug. Sept. Oct.	269	3	3	—	57	34	3	158	78	6	5	1	—	14	2	—	—	—	—	1½	21	55½	3½	—	—	—	—
1822	Ditto.	Ditto.	187	1	1	—	97	55	3	152	61	14	1	—	1	—	—	—	—	—	—	—	3	9½	100	—	—	—	
1823	Ditto.	Ditto.	290	—	—	—	26	18	1	179	111	5	11	3	1	19	13	1	—	—	—	—	4	2½	9	5½	—	—	
1824	Ditto.	Ditto.	290	—	—	—	6	5	—	74	41	3	6	3	1	10	8	—	—	—	—	—	—	—	—	—	—	—	
			1036	4	4	—	186	112	7	563	291	28	23	7	3	43	23	1	—	—	—	—	3½	5	13	—	—	—	

MEDICAL RETURNS

FOR THE

NAGPORE DIVISION OF THE BENGAL ARMY,

FOR A PERIOD OF

THREE YEARS, VIZ. FROM 1822 TO 1824 INCLUSIVE.

[See p. 133.]

YEARS.	SEASONS.	MONTHS.	Effective Strength.	Cholera.			Dysentery.			Fever.			Hepatitis.			Diarrhœa.			Per-Centage of Admissions.					Per-Centage of Deaths upon Admissions.					REMARKS.		
				Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.	Cholera.	Dysentery.	Fever.	Hepatitis.	Diarrhœa.			
1822	Cold Season.	Jan. Feb. Nov. Dec.	2851	2	2	—	50	31	—	152	113	—	7	3	1	19	17	—	$\frac{1}{14}$	$\frac{17}{21}$	$\frac{1}{13}$	$\frac{17}{14}$	$\frac{53}{82}$	$\frac{4}{10}$	$\frac{7}{7}$	—	—	—	14 $\frac{7}{10}$	—	The Returns for January and February 1823 are wanting.
1823			Ditto.	2145	1	—	—	32	17	1	227	157	4	8	7	—	6	5	—	$\frac{1}{21}$	$\frac{16}{13}$	$\frac{1}{13}$	$\frac{1}{21}$	$\frac{16}{82}$	$\frac{10}{10}$	$\frac{7}{7}$	—	3 $\frac{8}{73}$	$\frac{17}{2}$	—	
1824			Ditto.	3951	3	2	1	52	33	4	195	135	4	29	13	2	6	4	—	$\frac{1}{13}$	$\frac{13}{13}$	$\frac{5}{5}$	$\frac{4}{4}$	$\frac{4}{4}$	$\frac{1}{6}$	33 $\frac{1}{3}$	7 $\frac{3}{3}$	2	6 $\frac{9}{10}$	—	
1822	Hot Season.	Mar. April, May, June.	8947	6	4	1	134	31	5	574	405	8	44	23	3	31	26	—	$\frac{1}{15}$	$\frac{14}{13}$	$\frac{1}{13}$	$\frac{1}{15}$	69 $\frac{7}{8}$	$\frac{1}{13}$	$\frac{1}{13}$	16 $\frac{3}{3}$	37 $\frac{1}{3}$	$\frac{13}{18}$	6 $\frac{7}{8}$	—	
			3821	5	3	—	92	61	2	927	671	9	35	12	1	3	2	—	$\frac{1}{12}$	$\frac{23}{18}$	$\frac{24}{13}$	$\frac{10}{9}$	$\frac{10}{13}$	—	2 $\frac{1}{8}$	$\frac{18}{4}$	$\frac{13}{1}$	28 $\frac{2}{3}$	—		
			4710	4	1	3	51	28	2	612	482	2	21	8	1	63	41	1	$\frac{1}{12}$	$\frac{17}{13}$	$\frac{13}{54}$	$\frac{4}{5}$	$\frac{13}{9}$	75 $\frac{1}{2}$	4	$\frac{1}{3}$	43	13	—		
1823	Ditto.	Ditto.	4165	7	1	6	66	44	2	218	164	—	22	10	—	19	13	—	$\frac{1}{6}$	$\frac{13}{13}$	$\frac{54}{54}$	$\frac{5}{5}$	$\frac{4}{9}$	65 $\frac{1}{2}$	3	—	—	—	—	—	
1824	Ditto.	Ditto.	12696	16	5	9	209	133	6	1757	1317	11	78	30	2	85	56	1	$\frac{1}{8}$	$\frac{13}{13}$	$\frac{104}{104}$	$\frac{3}{3}$	$\frac{2}{2}$	56 $\frac{1}{4}$	28	$\frac{3}{3}$	25	1 $\frac{1}{6}$	—	—	
1822	Rainy Season.	July, Aug. Sept. Oct.	3621	—	—	—	184	111	9	756	526	12	57	19	5	2	2	—	—	$\frac{51}{26}$	$\frac{28}{15}$	$\frac{15}{7}$	$\frac{18}{13}$	—	4 $\frac{0}{10}$	$\frac{15}{4}$	87	—	—	The Returns for January and February 1823 are wanting.	
1823			Ditto.	4537	2	—	2	126	70	14	760	466	30	35	13	5	75	51	2	$\frac{1}{2}$	$\frac{27}{33}$	$\frac{15}{123}$	$\frac{7}{14}$	100	11 $\frac{1}{2}$	4	14 $\frac{3}{10}$	23	—		
1824			Ditto.	3945	10	5	3	129	77	5	496	339	17	53	30	1	17	12	—	$\frac{4}{4}$	$\frac{33}{33}$	$\frac{123}{123}$	$\frac{14}{14}$	$\frac{4}{3}$	30	3 $\frac{1}{2}$	34	17 $\frac{0}{10}$	—		
1822	Rainy Season.	July, Aug. Sept. Oct.	12153	12	5	5	439	256	28	2012	1331	59	150	62	11	94	65	2	$\frac{1}{10}$	$\frac{36}{36}$	$\frac{163}{163}$	$\frac{13}{13}$	$\frac{7}{7}$	41 $\frac{3}{3}$	6 $\frac{3}{3}$	20 $\frac{0}{10}$	7 $\frac{3}{3}$	2	—		

APPENDIX, No. II.*

On the Medical and Physical Topography of the Nilgherry Mountains.

ALTHOUGH the Coimbatore country, in which the Nilgherry mountains are situated, has been under the Madras Government for many years, it is but recently that we have come to any knowledge of its salubrity; and although Mr. Sullivan, the collector of Coimbatore, has, with the most laudable zeal, persevered for some years in drawing attention to these mountains, as a place of resort for invalids, we have reason to believe, that, even at this time, they are but partially known.

The following very interesting account, drawn up by Assistant-Surgeon England, and which does him much credit, will not, we trust, be uninteresting.

It is with feelings of deep regret we have to mention the death of this gentleman, whose zeal and industry could not have failed of proving advantageous to that service of which he promised to be so valuable a member. We hope, however, that his example will be followed by many others; and that we shall not long be kept in ignorance of the local peculiarities of districts and countries in India,—a knowledge of which is so often required upon important occasions; and is so conducive to the success and welfare of our civil and military undertakings. Information respecting peculiarities of situation and climate would not only assist the medical man in the discharge of his duties, but it would enable the Governments in India to guard against many inconveniences the army is sometimes liable to suffer from the want of it. This we have often witnessed; and with the view of drawing attention to the subject, we formed the reports of the diseases most prevalent in the different divisions of the Madras army, published in our “Sketches of the Diseases of India,” with the hope that similar reports would be made at the sister Presidencies. We are fully convinced that there is no want of zeal or talent amongst the medical profession in India, if it were properly called into action.

NOTES ON NILGHERRY.

“The Nilgherry is a considerable mountain, situated in the southern part, commonly called the Peninsula of India, between the parallels of $11^{\circ}30'$ and 12° of north latitude, and 76° and 77° of east longitude, being 36 miles in length from east to west, with a medium breadth from north to south of 20 miles. On its north side lies the country of Mysore, and the river Myaar, which rounds the mountain to the eastward;—on its west is situated the province of Malabar, and the great range of the Ghauts in that direction;—on its eastern and southern sides is the low country of the district of Coimbatore and the river Bowhany, which rounds the Nilgherry from south-west to east, and unites with a branch of the Myaar at Poongur, near Danaikancoattah. The mountain, on its western side, in the vicinity of a peak called Moorkooretty-betta, is connected with the Ghauts to the extent of

* For the details of the medical returns of the army under the Madras Presidency, see “Sketches of the Diseases of India.”

two miles, and it is separated from the latter on the south-west by the Koondah hills. The lower part of the Nilgherry consists of irregular and towering hills, and almost perpendicular and rocky steeps in many parts, which are covered with thick and high woods, to the extent of 4000 feet upwards; but the parts which are situated from 1000 to 4000 feet above these distances, are open and generally cultivated. This portion, which may be termed the surface of the Nilgherry, consists of a congeries of hills, varying infinitely in height and figure: in some parts they are connected by slight inequalities, and in others by rugged steeps and narrow valleys, most of which are supplied with rivulets, and a few of them are swampy. The small hills are the usual situations of the hamlets: they are, consequently, not far distant from the brooks below, and are, moreover, sheltered by the high hills which generally encircle the former, and afford a very picturesque perspective, which is often enriched with occasional woods of fine trees of considerable height, and patches of land covered with grain in various states of vegetation, reaching even to the summits of many of the most elevated hills. The surfaces of the hills are mostly flat, but it is barely possible to find a continuation of even ground to the extent of a quarter of a mile. The western portion of the Nilgherry is generally much the highest, and the eastern the lowest; but the most elevated parts are in the central portion of the mountain, the highest hill of which is called Dodabetta, which is nearly 9000 feet above the sea. There are the five following passes between the base and surface of the mountain, — from Streemooga on the south-east, from Danaikancoattah on the east, from Daroypatanam on the north, from Soondaputty on the south, and from Goodaloor, in Wynaad, on the west. The first of these passes has been recently made eligible for travellers of every description, by a road which has been made, leading rather circuitously up the mountain, in a north-western direction, and terminating in a highly sheltered, picturesque, elevated, and central part of the surface of the Nilgherry, called Wuttacamund, which, by this route, is 28 miles from the base, and 30 from Streemooka, which is a considerable village, situated on the south side of the Bowhany. Wuttacamund consists of an extensive collection of small pasturage hills, surrounded by higher ones, which are beautifully diversified with high and fine woods: the former are divided in many places by narrow swamps; but as they appear to proceed from the water which issues from the bases of these small hills, which have springs, and as they are perpetually drained by the streams below, there is never any noxious effluvia arising from them. The Bowhany and Myaar have their sources from the upper portion of the Nilgherry, some of which are seen running in a winding and westerly direction, in deep beds, occasionally expanding in low ground, and forming considerable cataracts, leading into the low country. The Nilgherry is divided into three nominal partitions, called nauds; namely, the Todernaud, the Paranganaud, and the Maikanaud. The former of these nauds consists principally of pasturage, and the two latter of corn land, interspersed with woods of large trees, and patches of flower and fruit-shrubs, brushwood, fern, long grass, the bramble, and the thistle. Cultivation is not much attended to, excepting in the vicinity of the hamlets, which parts the inhabitants manure with the dung of their cattle, in which large quantities of straw and other vegetable productions have been allowed to rot. The other parts are merely weeded, and turned up with the plough to an inconsiderable depth, and afterwards sown; and when the land becomes too unprolific, it is deserted for a time, when another spot is substituted. As the grains of the mountain do not require artificial watering, the streams are never used by

the natives for irrigation. The principal period of agriculture is from March or April until December, between which periods sowing and reaping are going on together, but the poppy season commences in the latter month, and terminates in March. The dwellings of the natives are of mean construction, but those of the sect called Toduar are somewhat curious;—the roofs, which are thatched with grass, are in the form of arches, which reach to the ground; the ends are closed with wooden planks, in one of which a doorway is made, which is barely large enough to admit a man to enter, even in a greatly bent position. The population of the Nilgherry is estimated at upwards of 5000. The eastern and southern portions of the mountain are the most thickly peopled, and some of the extreme parts of the west are uninhabited. The soil of the upper portion of the Nilgherry consists of a layer of dark mould, which, in a few parts, is five or six feet in depth, but it is generally much thinner, and in some places it is not found: the second stratum is composed of a very fine yellowish, gravelly soil, and amidst, as also on the surface of this layer, small quantities of a rather porous and yellowish stone, partaking of the soil below, is not infrequent. Under these strata, beds of whitish or grayish granite are usually found, which appear to form the basis of the mountain: in many places it is seen on the surface, in small and detached portions, and frequently in the form of huge rocks. Pits of white aluminous earth are found in most parts of the mountain; and in the beds of the rivulets a dark sand is sometimes seen. The chief produce of the Nilgherry consists of wheat, barley, peas, the various kinds of small grains, called by the natives, saumey, arndee, coorillee, ragghce, mentium, and sarnaghee; together with opium, onion, garlic, mustard, milk, ghee, and honey. The large trees, which mostly compose the woods, are generally soft, and unfit for the purposes of building; but there are two kinds, called warrallee and hooloomookey, which are sufficiently durable for such uses. There is also a small tree, called hoolooney, the timber of which is hard, and excellent for many purposes. Most portions of the mountain, but especially those of the east and south-east, are diversified with large collections of a handsome shrub, called towtahun, which occasionally grows to the height of eight or nine feet: the root is hard, woody, tough, brownish, and composed of many crooked fibres; the stalks are numerous, slender, and woody; they are whitish within, and covered with a brownish bark; many twigs proceed from them, that are angular, and furnished with oval, smooth leaves, which grow to upwards of an inch in breadth, and two inches in length; they are green above, whitish below, and generally placed opposite each other; the flowers are small and beautiful, and greatly resemble those of the common peach-tree; several of them proceed together from the same tubercle as the leaves, and they have a short and greenish pedicle; they are rosaceous, and consist of five small petals, that are whitish without, and have a purplish tinge within; an immense number of purple stamina, with a small yellow apex on each; a whitish, sharp-pointed pistil, about the length of the stamina, and a greenish calyx, about a quarter of an inch in length, of the form of a basin, and divided at the top into five blunted and denticulated parts, which become subsequently situated around the top or umbilicated portion of a globous berry, which forms behind them, and grows to the size of the red hairy gooseberry; it is composed of a thin, greenish skin and green pulp, which is divided into three cells, each of which contains two rows of brownish, triangular, and flattish seeds, having four or five of them in every row; its flavour greatly resembles that of the gooseberry, and it is deemed very wholesome. This shrub produces fruit, in some parts, throughout

the year, but it is most abundant from June until November. Amongst the indigenous fruits are, the orange, lime, red and white strawberry, barberry, cranberry, three species of the bramble, one of them bearing a fruit resembling the blackberry, another of a yellow colour and of similar conformation to the latter, and a third having a berry of great resemblance to the red raspberry. Amongst the medicinal plants, the poppy and foxglove appear to be the most useful. There are a great variety of beautiful flowers, but very few of them possess much fragrance. The herbage of the mountain is sour and weedy, and only fit for the buffalo and the ox. Most of the culinary vegetables, and some of the fruit trees, which are found in Europe, grow luxuriantly on the Nilgherry, and afford excellent fruit. The principal domestic animals are, the buffalo and a rather small species of the ox. Amongst the wild animals are, the elephant, tiger, black bear, and monkey, wild dog, jackall, porcupine, hog, elk, deer, hare, vulture, peacock, cock, quail, and snipe. There are several small birds, with pleasing notes, amongst which, those of the lark, on its ascension in the air, reminds one of the melodious sounds which this bird affords in a temperate latitude. A species of wild sheep is said to inhabit the woods; but I am disposed to believe that this must have arisen from mistake, as those parts are infested with the most formidable enemies of that animal, and as it has been also said to resemble the common gazelle. The elephant and tiger inhabit the low, woody portion of the mountain, but the latter frequently ascends to the surface.

OF THE CLIMATE OF THE NILGHERRY, &c.

“ The eastern side of the mountain is mostly visited by the north-east monsoon, and the western side by that of the south-west; but their directions seem to be often changed by the influence of its high ranges, and the whole of it appears to partake of both the seasons in an almost equal degree, excepting a few sheltered parts, such as Wuttacamund, where heavy rains and boisterous winds are less frequent than elsewhere. The greatest falls of rain prevail during the heights of the monsoons; and the rainy season sets in usually in May, and continues, with frequent intervals of very fine weather, until December. The average states of the weather throughout the year are as follow:—The two first months are the coldest; and these, as well as March, are generally free from rain. During part of this period, frosts are not infrequent on the most elevated spots. In April there are occasional showers;—in May, June, and July, considerable rains. August and September are showery. In October and November there are frequent rains and heavy fogs. December is partly wet and foggy, but occasionally dry and frosty. High winds are most prevalent at the commencement of the south-west monsoon. Heavy fogs are rather frequent at all periods, but the neighbourhood of Wuttacamund is said to be almost exempt from them, as also of the drizzling rains, which are common, and sometimes of long duration, on most parts of the mountain. The air is naturally always keen; and as it is not greatly heated by the powerful rays of the sun, a hot parching wind or sultry atmosphere is unknown here. The temperature of the weather is generally very equable and cool in the major parts of the surface of the mountain. The thermometer has never been seen as high as 80° even at Jaggernary, which is the lowest station on the new road, as it is said to be about 5,275 feet above the sea, according to a rough calculation made by Mr. Orton, at Wuttacamund, which is estimated by the same gentleman at 7,215 feet above the sea. The usual

range of the thermometer is about ten degrees lower, that at Jaggernary being never at the summer heat of England, during the hottest periods, or rarely below the freezing point in the coldest. The contrast of atmospheric heat is, consequently, considerable between the places on the surface of the Nilgherry and those at its base, especially on its eastern and southern sides, where the thermometer is seldom below 70°, but is often as high as 90° or even 100°.

OF THE PHYSICAL AND MORAL CONSTITUTION OF THE INHABITANTS, &c.

“ The natives of the Nilgherry consist principally of five sects or casts of the Hindoo religion, but dissenting in some respects from its established forms. They are severally known by the appellations of Toduar, Buddagar, Cotar, Mallurcurrumber, and Irrelar. The first lead a pastoral life, being occupied in taking care of large herds of buffaloes, and deeming any other employ derogatory to their cast; they are remarkably robust, and have a brown complexion, with almost uniformly handsome and manly features; they live in a state of concubinage, and one female is the allotment to a family of brothers, who is selected by the eldest, and who has also the privilege of choosing a paramour, who generally engrosses most of her society. Female infanticide has been attributed to the Toduars, but with what correctness I cannot determine; it is certain, however, that the women are infinitely fewer than the men, although the children of both sexes do not present any remarkable contrast in their respective numbers. The food of this cast consists chiefly of milk; the hill grains, and the flesh of the young male buffalo. The Buddagars are the principal agriculturists of the mountain: they are said to have emigrated from Mysore several hundred years ago: although polygamy is permitted with them, they have seldom more than one wife: they acknowledge the right of the Toduars to claim a small quantity of their grains annually, in return for having been originally permitted by the latter to cultivate the land. The Buddagars have also herds of milch cows and buffaloes, and some oxen; the latter of which they use in the plough: their food usually consists of a meal generally made from their worst grains, together with buttermilk and inferior sorts of vegetables; and it is said that the women and children are often fed on bran—consequently, they are not robust; but many of them possess handsome features, and their complexion is almost as light as that of the Toduar. The Cotars are the artisans and musicians of the upper part of the Nilgherry; they are also cultivators, and have cattle, similar to the Buddagars; they live on the vilest food, being the only cast that is allowed to eat the flesh of the cattle which die from disease or old age; they are the darkest and most ill-looking race of the mountain, with a few remarkable exceptions: polygamy is permitted, but seldom practised among them. The Toduars and Cotars are said to be the aborigines of the surface of the Nilgherry, and the former the chiefs: however, as the above three casts, who reside on it, have a dialect peculiar to each, and as the Cotars pay a tribute to the Toduars annually, similar to the Buddagars, it is probable that the Toduars are the sole aborigines. These several casts have their hamlets remote from each other, and social intercourse between them is interdicted. The Mallurcurrumber and Irrelar inhabit the low and woody portions of the mountain: they cultivate the plantain and castor, and a few of the small hill grains: they are deemed to be of an inferior cast to the Buddagar, but superior to the

Cotar, and they have the most frequent communications with the natives of the low country. The children of the Buddagars and Cotars have generally small limbs, with a protruding abdomen, and they appear to bear the marks of a weakly constitution, arising from poor food. The age of puberty, among the boys, is about the fourteenth year, and the thirteenth that of the girls. The women are very prolific, and menstruation ceases with them about the fortieth year. The natives are remarkable for sobriety, and they often attain the age of sixty and seventy years; but I believe that many of them die when very young, from privations of food. Their dress chiefly consists of a wrapper of cotton cloth around their bodies, which, although white and clean at first, soon becomes most filthy, as they never wash their clothes, arising from a religious prejudice: the head-dress consists of a cloth tied around it, but the Toduar and Cotar do not use any: the most current language is that of the Buddagars, which is a corrupted dialect of the Canãrese. The disposition of the Toduar is frank; but the other casts are extremely servile, cunning, and penurious. There are no priests on the mountain, or proper places of worship; but the natives occasionally proceed to some of their sacred hills, especially to that called Rungutsawmy, to offer up their devotions to their deity of that name. Reading and writing are not practised among them: these acquirements have, however, been introduced lately, in a partial degree; but as they appear to have an antipathy to them, their progress has been very slight. Their marriage ceremonies appear to be nothing more than a private contract between the parties, which may be easily dissolved. Their burial ceremonies are as curious as they are barbarous: around the deceased, buffaloes are driven until they become exhausted; this parade is joined with their discordant music; and, until lately, it was customary for the animals to be driven astray, and become the property of the neighbouring Cotars, who usually kill them for food.

OF THE DISEASES WHICH ARE MOST FREQUENT AMONGST THE NATIVE INHABITANTS OF THE NILGHERRY, &c.

“As open and mountainous spots are proverbially healthy, and exempt from most of those epidemic scourges which infest many low countries, it might be naturally presumed that this mountain offers the same advantages,—and, indeed, I am disposed to conclude that it does; for most of the diseases of the natives may be traced to exposures to damp whilst inadequately clothed, to filthiness, and, above all, to unwholesome diet: fever, mostly intermittent types, dysentery, unattended with scybala, rheumatism, and pulmonary affection, are the principal diseases. It is impossible to form any accurate estimate of the deaths from disease, as the inhabitants are exceedingly prone to deception; but, from the inquiries which I have made, I feel assured that they are proportionally small, and would be infinitely fewer, if they would allow themselves those comforts which their niggardly views, want of industry, and religious prejudices, withhold from them. The Toduars throughout the mountains are notoriously healthy; and as they live better than the other inhabitants, it might, I imagine, be truly ascribed to this cause. There are, I have heard, a very few cases of leprosy on the Nilgherry; but the disease is not deemed infectious by the natives. I have seen one of these cases, which has destroyed most of the joints of the fingers and toes, and produced several ulcerations on the legs;

the subject of which is an elderly man, who has a healthy and considerable family residing always with him. During the poppy harvest, the reapers indulge in too free a use of the juice from the capsules of that plant, which proves injurious to many, and fatal to a few. I have seen one case of a scirrhus enlargement of the liver, accompanied with ascites, amongst the natives, which terminated fatally. I have met with several persons with severe coughs; and I have lately had a patient brought to me with phthisis confirmata, the subject of which was a female, about thirty years of age. A few cases of dysentery, and fever of intermittent types, have come to my knowledge, and two deaths arising from the former; but they were left to the efforts of nature for relief, unaided even by the common necessities of life. The attacks of fever which I have seen have not been severe; and they have been effectually removed, in general, by an emetic, and sometimes by an active purgative, whenever these remedies have been used at the onset, and the subject had not been previously afflicted with the same disease. The cases of dysentery are frequently preceded by diarrhoea mucosa, and a universal uneasiness and chilly sensation. The functions of the cutaneous system are undoubtedly sometimes obstructed by the operation of the cold fogs that often suddenly succeed to serene and sunshiny weather, which must occasionally produce an inordinate action of the mucous membrane of the intestinal tube. This state, if not timely checked, will naturally lead often to bloody and mucous stools of a grave description, which must frequently terminate fatally amongst the natives, as their constitutions and habits oppose almost insurmountable obstacles to their recovery, and as they are not acquainted with the use of medicines, or even the most ordinary prophylactics.

OF THE EFFECTS OF THE CLIMATE OF THE NILGHERY ON EUROPEANS AND NATIVES OF THE LOW COUNTRY, &c.

“ During my stay on the mountain, only a few Europeans have resorted to it on account of ill health: amongst these may be enumerated the following cases; first, a chronic affection of the liver; second, a dyspeptic affection, accompanied with paralytic symptoms of the upper extremities; third, a convalescent from a severe attack of dysentery; fourth, debility and an impaired state of the chylopoetic viscera, which succeeded to an attack of hepatitis. The subject of the first case became much better; but in consequence of unavoidable exposures to bad weather, arising from a residence in a bad habitation, a relapse into his original state was brought on, together with rheumatic pains, and two attacks of a mucous diarrhoea; and although his health has somewhat improved lately, yet a want of the necessary comforts on the Nilgherry renders it expedient for him to proceed elsewhere to obtain the benefits of a temperate climate. The second case has been long since entirely relieved of the dyspeptic, and nearly, if not completely, of the paralytic symptoms. The subject of the third case is in the enjoyment of vigorous health. The subject of the fourth case suffered, at first, from the effects of cold, which brought on a slight tumefaction of the liver, accompanied with pyrexile symptoms and mucous stools; but he is now fast recovering. My health, which has suffered much from hepatic, febrile, rheumatic, and dysenteric affections, has greatly improved. Amongst a great number of native servants, who have come hither from the low country since last August, I have only observed a few cases of slight mucous diarrhoea; one of mild intermittent fever,

the subject of which had been previously afflicted with it in the low country of Coimbatore : and one case of slight dysentery. As these persons had not the benefit of warm clothing and suitable dwellings, the circumstance of their comparative healthiness, after undergoing so great and sudden a change of climate, may be deemed a powerful proof of the salubrity of the mountain : and since it has been ascertained, from the cases that I have mentioned, as well as from what has been already published, that it has been highly beneficial to invalids who have suffered constitutional derangements from dyspeptic, liver, and bowel affections, especially when they have been gradually brought on by a protracted residence in a hot country, or have assumed an obstinate chronicity in a reduced and debilitated system, even under the disadvantages of almost insurmountable difficulties, arising from a total deficiency of prophylactic requisites,—there is ample reason to believe that patients suffering from the foregoing diseases would be generally restored to health on the Nilgherry, if they could obtain those collateral necessities which are now withheld. The keen and rarefied state of the atmosphere, together with the chilling fogs, often prove distressing to new comers, especially at night, unless they be warmly housed and clothed,—by occasioning rheumatic pains, slight spasms of the trunk, mucous diarrhœa, coldness of the extremities, frequent calls to urine, with a painful constriction of the bladder, and a universal uneasiness throughout the whole body ; but the hæmorrhages which are said to be caused by the rarity of the atmosphere in more elevated situations never happen here. The above symptoms, if not checked by proper care on the part of the sufferer, by procuring woollen clothing and a warm habitation, may, I am convinced from experience, lead to fever, dysentery, rheumatism, or affections of the liver, spleen, lungs, &c. ; but if the above precautions be taken, together with a careful avoidance of protracted exposures to rain, damp, and the sun's rays, which, from their perpendicular inclination, are very powerful, no dangerous consequences need be apprehended. The chilliness occasioned by the rarefied state of the mountain air, which arises probably from its relatively light pressure on the body, and diminished quantity of oxygen, is very remarkable to strangers, and ought to convince us of the necessity of making allowances for those sensations on our system, instead of being guided by the state of the thermometer, which, although it will give us the actual relative degrees of atmospheric heat, must form a rather deceptive criterion for judging of its effects on the animal system, which is regulated by such complication of processes. Long exposures to the sun sometimes occasion headaches and bilious attacks in delicate habits ; and as by the operation of the keen, cool atmosphere the cutaneous discharge often becomes quickly checked, the rays of heat often burn the face of many Europeans in a considerable degree. After an exposure to the sun's hot rays, the invalid feels extremely chilly towards the evening, especially during the first two months of the year, when the atmosphere is usually serene, and the night and day present the greatest and rather considerable contrasts of atmospheric heat ; indeed, the difference of sensation is as great as that caused by a removal from the warmth of a fire, in a temperate latitude, on a cold winter's night, into an apartment unprovided with such artificial heat ; consequently the use of fires on the Nilgherry, to very sickly invalids, is indispensable in the coldest evenings ; for they should cautiously avoid subjecting themselves to unpleasant rigors, as they occasionally produce temporary pain and tumefaction of the spleen, attended with pyrexia and other unpleasant affections. I must beg leave to add, that I believe it would be imprudent to recommend the Nilgherry as a place of resort for invalids,

whilst the sea is open to them, until suitable dwellings and other necessities can be obtained with facility on the mountain; which desirable objects might be attained with less inconvenience and expense than on most other spots of equal elevation, if the natives could be encouraged to supply Europeans with their labour, cattle, and grains, at a valuation which would be beneficial to them, to the procurement of which their indolent disposition and limited views oppose the only obstacles. It has been already observed, that the late direful visitations of the epidemic cholera did not proceed up this elevated mountain. This phenomenon, together with the well-known fact that the natives of the Alps are always notoriously healthy, whilst those of the marshy plains of Lombardy suffer from epidemical diseases, are clear demonstrations of the salubrity of high situations. Although the climate of the Nilgherry is not quite so dry as might be desired, yet the rains are indispensable for agricultural purposes, and are not productive of disease amongst the inhabitants, excepting from long and improper exposures to them. Indeed, I am disposed to believe, that the wet season is as salubrious as the dry one, and even more so. The occasional mists which are the natural consequences of a mountainous atmosphere, that must quickly become saturated with the passing aqueous clouds, might be deemed unpleasant; but with a comfortable house, and the ordinary precautions, not the least ill effects can arise from them; and when slight, they are in no way disagreeable, especially by day, as they materially tend to lessen the influence of the sun's hot rays. As the neighbourhood of Wuttacamund is rarely visited with any unpleasant or protracted rains, fogs, or high winds, arising from its central situation, and the elevated ranges of hills which encircle and shelter it, I consider it the most eligible spot for the erection of buildings for the use of invalids. I think it desirable for invalids to ascend the mountain in a light dooly, or monsheel, as the fatigue of riding on horseback is excessive to weakly persons, and likely to prove injurious to them. As a few public huts have been erected on the road from Streemooka to Wuttacamund, the journey from the former to the latter place may be comfortably accomplished in two days. The following copy of a letter which Captain Macpherson has favoured me with, speaks highly of the climate of the Nilgherry.

Rajah, Nilgherry Mountain, 24th January, 1823.

“ ‘ I am favoured with your letter of yesterday's date, requesting to be informed what diseases I may have observed to prevail, and what number of deaths may have occurred amongst the natives of the low country whilst employed under my orders, on the Table, or upper surface of the Nilgherry mountains. In reply, I beg to state to you, that the number of people of that description, including sepoys, and my own servants and followers, may have been varied from 100 to 150: the period we continued on the Table Land, (about one year,) the number of casualties within the twelve months was four. The very small proportion of deaths amongst a set of men of all casts and ages, exposed as they unavoidably were to numerous privations, living in wretched temporary huts, and generally sleeping on the cold ground, in a climate so very foreign to their former habits, is, I think, sufficient proof of its remarkable salubrity. The disease of most frequent occurrence amongst the party was bowel complaint, probably occasioned by their being so badly lodged, together with their clothing being so perfectly unsuited to the climate. Cases of intermittent fever were not infrequent on their first arrival, (if intermittent fever it could be called,) but so very mild, as almost in every

instance to yield to a single dose of opening medicine. A malady, however, of almost universal occurrence prevailed amongst us ; viz. hunger : for all complained that their appetite was so great as to demand three full meals a day, while below two served them ; and that their pay was insufficient to fill their bellies."

" If further testimony were necessary to confirm the salubrity of the climate, it might be derived from the many years' experience of it by Mr. Sullivan, the principal collector and magistrate of the district of Coimbatore, who considers it as healthy as that of any portion of the globe. The accompanying Tables shew the mean monthly and annual temperatures of the weather at Wuttacamund to be nearly the same as those of May and September at London, which may be deemed the most pleasant months of the year in England. The extremes of temperature are shewn to be, at times, much greater in London than they ever are at Wuttacamund. At the former place, on the following days in July of 1808, Fahrenheit's thermometer was observed to be, on the 1st, at 53°; on the 12th, at 88½°; on the 13th, at 91°; on the 14th, at 93°; and the mean temperature, for the whole month, was about 68°. The weather at Wuttacamund seems to be singularly different, as well as eminently superior to that of any other parts of the Nilgherry, which has induced me, principally, to insert the above-mentioned Table of it, which has been kindly furnished me, and which will suffice for my inability to supply one on these and other meteorological observations for the five months that I have resided on the mountain, arising from my not having been able to procure the necessary instruments. The natives of Wuttacamund, who are exclusively Toduars, bear the marks of a healthy climate in a remarkable degree. Their stature is tolerably tall; their trunk and limbs well proportioned; their muscles firm, fleshy, and elegant; their head of the medium size, with a convex crown; their forehead rather large, and slightly arched; their hair of a jet black; their eyes full, black, and animated; their eyebrows elegantly arched; their nose of a moderately aquiline shape and medium length; their mouth small, with thin lips and white teeth; their chin and cheeks slightly and gracefully prominent, and approaching to an oval form; their ears small; and their complexion, as I have already observed, of a darkish brown. The men wear thick hair on their head, (rounded like our ancient wig,) and large whiskers, with beards on the sides of their face, which they uniformly adhere to, and consider as marks of distinction.

A METEOROLOGICAL TABLE,
TAKEN AT WUTTACAMUND,

FOR THE YEAR 1822.

MONTHS.	Temperatures of the Weather, as observed in a Hut, between 6 o'clock, A.M. and 6 o'clock, P.M. by Fahrenheit's Thermometer.			Number of Days of dry, fair Weather.	Number of Days attended with partial Rains.	Number of Days attended with continued Rains.	Number of Nights attended with Frosts.	Number of Days attended with Fogs.		Number of Days attended with Strong Winds.				Number of Days attended with Mild Winds.			
	Greatest.	Mean.	Least.					Partial.	Continual.	Northerly.	Southerly.	Easterly.	Westerly.	Northerly.	Southerly.	Easterly.	Westerly.
January	60	54	36	29	2	—	11	—	—	4	1	1	—	10	2	2	1
February	61	55	42	28	—	—	11	—	—	1	—	—	—	6	—	—	—
March	61·5	56·5	50	27	3	1	—	2	—	—	—	1	—	2	—	—	—
April	68	67	48	23	7	—	—	—	—	—	—	—	—	3	—	—	—
May	72	62	52	23	5	—	—	—	—	—	—	—	2	1	—	—	—
June	64	57	53	27	3	—	—	—	—	—	—	—	—	2	—	—	10
July	65	57	53	6	20	5	—	—	—	—	—	—	—	—	—	—	—
August	64	57	52·5	16	14	1	—	2	—	2	—	—	2	4	—	—	3
September	66	57	50	17	9	4	—	1	—	—	—	—	—	—	—	—	—
October	62·5	56·5	52	25	4	2	—	2	—	—	1	—	—	8	4	7	1
November	60	56	49	17	12	1	2	2	1	—	2	—	—	9	2	4	—
December	60	54·5	42	22	9	—	4	—	—	1	—	—	—	20	4	—	—
Annual . . .	72	56·625	36	266	88	14	28	10	1	11	2	2	6	65	13	17	35

A THERMOMETER TABLE,
TAKEN AT LONDON.

TAKEN AT LONDON.

Mean Temperature of the Weather in London for Nine Years ; viz. from 1772 to 1780, as observed at the Apartment of the Royal Society, by Fahrenheit's Thermometer.		Greatest Heat observed in London by Fahrenheit's Thermometer.	
<i>Months.</i>	<i>Degrees.</i>	<i>Dates.</i>	<i>Degrees.</i>
January . . .	35.9	1802. July 3d. . .	83
February . . .	42.3	1803. August 30th	80½
March	46.4	1804. June 25th .	85
April	49.9	— August 3d .	84
May	56.64	1805. July 4th . .	79
June	63.22	1806. June 14th .	82½
July	66.3	1807. July 15th .	83
August	65.85	— August 13th	83
September . . .	59.63	1808. July 12th .	88½
October	52.81	— July 13th .	91
November . . .	44.64	— July 14th .	93
December . . .	41.04		
Annual . .	51.9		

f

Nilgherry, 29th January, 1823.

(Signed) R. ENGLAND.

Observations on the Mysore and Canara Districts.

[See pp. 143 and 145.]

THE following letters, addressed by the late learned and scientific Colonel Lambton to Dr. Boswell, late member of the Medical Board of Madras, will further illustrate what we have advanced respecting the Mysore country and Canara. The medical profession and European community in India are under great obligations to Dr. Boswell for his strenuous and scientific exertions to ascertain the causes and nature of the diseases of the Indian Peninsula, and to remove those causes, as far as their removal was practicable.

“ *Camp, 28th March, 1807.*

“ I find I have never kept the state of the thermometer while at Seringapatam, but have sent you the extremes and mean temperature while at three different stations where I had occasion to observe.

“ I believe it will be of little use to you, as the changes which take place are very trifling, and still less from the barometer, except from the change of height above the sea. You may probably be able to draw more inferences when you know the exact situation of the country. Seringapatam lies in a very low valley, and that valley runs north nearly as far as Chittledroog, and north-east past Serah and Paughur, into the Ceded Districts. The ridges which form it are the Table Land, which extends from Nundidroog till it is terminated by the mountains near the Cavery. Bangalore, or rather three miles east from Bangalore, is the highest part, and is about 3,030 feet above the level of the sea. After passing the range of mountains in which Kopauldroog, Savendroog, Shevagunga, &c. are situated, the country immediately falls as far as the Madoor river, which, as far as I recollect, is about the lowest part of the valley. After getting to the westward of Seringapatam and Cheneroyapatam, the country then begins to rise, till we reach the Ghauts which bound this great valley on the west. These mountains are peculiarly situated, and may affect the climate to the eastward: most of them are from 4 to 6000 feet above the sea, and are very abrupt to the westward, under which are situated the low countries of Canara and Malabar. These countries are not flat, like the Carnatic, but are full of rivers, ravines, and gullies, all which are cultivated and abound with trees of various kinds, and in many are ancient forests. After the conclusion of the western monsoon, the weather on the Malabar coast is delightful and serene, and the atmosphere perfectly clear, till about the middle of January, when the weather becomes hot. The exhalation from the ravines is the consequence; and that increases so fast, that about the middle of February the whole of the low country is covered with a thick vapour, which, from being checked in its ascent by the cold region at the summit of those mountains, continues to collect till the south-west winds set in, and that immense reservoir is then condensed, and passes over the country in those heavy rains which mark the western monsoon. Previous, however, to the setting in of the rains, the evaporation above the Ghauts is very considerable, and the whole of that valley which I have described is covered with

a vapour almost as heavy as that which hangs over Canara and Malabar. This is generally in the months of February and March and in the beginning of April, till the thunder-showers clear it away. It is likely that travellers may not take notice of this loaded atmosphere, because in those months there is a continued sunshine the whole day : nor perhaps should I have attended to the circumstance had not my avocations led me to it. When I passed through Mysore, the latter end of November 1804, I distinguished one of my signal-flags on the Mysore hill when I was at Savendroog, a distance of sixty-two miles. When I returned from the Malabar coast, through the same country, in March and the beginning of April 1805, it was with difficulty I could distinguish the same flag twenty miles.

“ How far such local knowledge may enable medical gentlemen to investigate the causes of those diseases that prevail in the low part of Mysore which I have described, you, and those of your profession, must judge ; but so forcibly was I struck with the circumstance, which I first discovered in 1801, that I mentioned it in my report to Government.

“ I at that time traversed the country to the westward of the Savendroog range from Seringapatam to Serah, and it was at the latter place my people were the most sickly. In November 1804 I was at Seringapatam, and sickness again began to prevail : I went to the westward, to a station (Mullapunchetter) near Grumum, and the malady became worse : I passed through the Koorg, and my people by degrees recovered. In December 1805 I visited Seringapatam, having both these seasons left the Table Land, near Bangalore, in high health : but sickness again prevailed more than ever, and several deaths happened in my establishment. I quitted Seringapatam, and moved northward, by degrees, to the same station near Gramum, during which time not only sickness, but mortality increased in my camp. I returned a second time through the Koorg, thence to Periapatam, Mysore, and Salliagul, and down to the Coimbatore, through a range of high mountains. All this time my people recovered a little, but several of them were so reduced that I sent them to the Carnatic.

“ There are several other facts which I cannot now recollect, and those that I have given you are from memory ; but you may rely on the justness of the statement, therefore make the best of them. I draw no inferences myself, because I am not competent to the task.—Believe me yours truly,

“ W. LAMBTON.”

“ I thank you for your report, and think as you do. I wish that some kind of bills of mortality had been kept in different parts of the country, particularly in the Carnatic and various places in Mysore. There are assertions that deaths are more numerous below than above the Ghauts ; but I doubt whether any just observations have been made to ascertain such a fact. There are also assertions that the fevers in Mysore are not confined to one place, but that they visit different parts of the country. It would be desirable to know all this ; but the modes, in general, taken to establish facts are so extremely unsatisfactory, that I have little faith in even the most positive assertions ; and the mode of assigning causes is equally superficial. I am myself fully of opinion that there is something in the atmosphere of a noxious quality, which is brought from a distance, and is suffered to hang over the low country, or rather is prevented from making its escape from it ; or if it is not brought from a distance, the same circumstance of being confined there may produce the diseases. Have you noticed the influence of particular seasons ? On whatever side of the peninsula the season

is hot, the wind blowing from the contrary side is extremely violent when it approaches those mountains which lie on the heated side, while it may be almost calm in the low country. In Mysore, during the hot winds in the Carnatic, the wind rushes like a torrent over the Eastern Ghaut; and in the months of December and January it blows a hurricane over the great mountains in the Koorg. This is regular, and may afford you hints.—Adieu. Yours,

“ W. LAMBTON.”

On the Medical Topography of the Districts under the Bombay Presidency.

[See p. 161.]

WE have been favoured by Lieut.-Colonel Briggs with the following interesting account of the districts under the Bombay Presidency. Colonel Briggs's well-known talents and science, as well as his very intimate knowledge of the country he describes, and of every thing interesting connected with our Indian territories, give great importance and value to his observations : —

“ The territory under the Presidency of Bombay extends from the vicinity of Goa northward, along the sea coast, to the latitude of the northern tropic, and it occupies a space inland from the sea varying from 100 to 200 miles. The most remarkable features of this superficial area are, in the first place, the inequalities of the elevation of the several districts above the sea; secondly, the ranges of lofty mountains which intersect it; and thirdly, the open plains and the forests which occasionally intervene. That part which lies along the coast is bounded by the range usually denominated the Western Ghauts, and is called, by the people of the country, ‘ Concan.’ This is subdivided by us into the northern and southern, of which the Panwell river, immediately opposite to Bombay, is considered the boundary. The northern limit of North Concan terminates where it meets the district of Surat.

“ The Concan exhibits, for the most part, a stratum of iron ore, is diversified by hill and dale, and thickly studded with wood. It presents also, throughout its whole extent, the usual concomitant of hot springs which abound in every direction, varying in temperature as far as 160° of Fahrenheit. The valleys of the Concan produce rice and other esculents, commonly grown in wet soils and moist climates. The numerous inlets from the sea, which connect with the mountain torrents, render the country liable to frequent and extensive inundations during the rainy months. With all these disadvantages, however, the Concan is by no means deemed unwholesome, and some few spots, such as Dapooly, near Savendroog, elevated a few hundred feet only above the sea, have been found to be peculiarly healthy. Fevers do occasionally occur during the autumnal months, but they have neither been considered very common or very malignant. The mountains lying to the east of the Concan, and which define its limit in that direction, are called Syhadree, or Singhadree, from their being much infested with tigers. From this great range, extending as far as to the neighbourhood of Surat,

numerous spurs or minor branches ramify into the interior, and serve to divide the districts of the upland plain, which lies from 1500 to 2000 feet above the level of the Concan, having on the whole a climate more temperate than it, and better fitted for the European constitution, excepting where local causes render it in some parts unhealthy. This tract we call Deccan, a term of more extensive signification among the natives, and applied by them to that portion of India lying south of the two great rivers Nerbudda and Maha-Nudda, which having a common source in Gondwara, disembogue on the opposite coasts into the ocean, and form the northern limit of the Indian peninsula. In speaking of the Deccan in the present instance, I limit the acceptance of the word to that adopted by us, which extends to all the table-land under the Bombay Presidency lying south of these hills, which run at right angles from the Western Ghauts, about the latitude of Daman. The temperature of this tract is decidedly healthy, in spite of the hot winds which prevail from March till June. From the latter month, when the rainy season commences, till October, the climate is moist and pleasant; during the ensuing three months agues are experienced by those who are much exposed to the night-dews, though they are not of a very serious nature. The temperature, though as high as 85° during the day, frequently falls below 50° during the night. The medical returns of Poona, however, for the last eight years, exhibit proofs of the salubrity of the Deccan climate, for Europeans in particular, beyond that of almost any other quarter of the globe. As connected with this subject, it seems proper to mention, that our countrymen may find a favourable retreat from the scorching winds during the months of March, April, and May, by ascending to the summits of those mountains which separate the Concan from the Deccan. On the spot where the rivers Krishna and Koena take their rise, near the Temple of Mahabléswur, is a table-land about eight miles square, situated at an elevation of 4,500 feet above the sea. It was my good fortune to be enabled to reside there during the hot-wind months for two successive years, and I may with safety declare, that a more grateful climate for man scarcely presents itself in any part of the world. But its advantages vanish as the monsoon approaches in June, when a retreat from the heat of the Deccan is no longer requisite. At this period a remarkable phenomenon occurs. During the greater part of the month of May, the Concan, lying so many thousand feet below, is obscured daily, till near noon, by dense volumes of clouds, which lie like fleece as far as the eye can see, till the sun, attaining its meridian height, dissipates them. In the evening these clouds, gradually collecting, come fitting over the table-land light as gossamer; for though they obscure an object within twenty yards from sight, yet they pass so quickly, and are so evanescent, that they hardly moisten the thinnest linen. As the monsoon comes on, however, these apparent shadows assume a more substantial shape, in the form of thick mist; and while the rain is pouring heavily over the Concan and the Deccan on either side, Mahabléswur is shrouded in one impenetrable fog for four months. The course of the south-west monsoon has been so accurately and beautifully described by Mr. Elphinstone, in his account of his embassy to Cabul, that it would be as useless as impossible for me to elucidate the theory more than he has done, though it may not be quite irrelevant to say something of its effects on the Bombay territories. The Western Ghauts, commencing near the point of the peninsula of India, assume

an elevation of nearly 9,000 feet, about the latitude of Coimbatore, from thence they gradually diminish as they approach to the north, and at Goa their height does not exceed 3,500 or 4,000 feet in height. It is here the monsoon, whose density prevents its rising to a superior elevation and passing the formidable natural barrier farther south, after being driven along its breast for five hundred miles, now tops the Ghauts, and showers its waters over the whole surface of the peninsula, being wafted across in a north-easterly direction till it meets an insuperable obstacle in the mighty Himalaya, or Snowy Mountains. Mahabléswur, the spot I have described, is at that point of elevation which the monsoon seems just able to surmount; and this accounts for its lying hid for four months in the fog I have mentioned. The inhabitants of this region, however, deny that it is unhealthy; and a native of the plain, for a small remuneration, preferred remaining there to being relieved monthly from the duty imposed on him of protecting some property left in his charge.

“ Leaving the Deccan, we proceed northward into the province called Candeish, or the Valley, a tract surrounded on three sides by mountains, but open to the east, where a small river only divides it from the plain of Berar. This province came into our possession in the year 1818; and although the army commanded by the Duke of Wellington suffered severely from fever in the autumn of 1804, the true character of the Candeish climate was not known till we occupied the province during the last Mahratta war. Its temperature is, for the most part, like that of the Deccan, and may justly be accounted healthy, with the exception of those hilly and woody tracks which I shall proceed to describe. From the month of September till the month of January, the lofty ranges on the north and south, and the jungly, mountainous country of Banglana on the west, dividing Candeish from the Surat district, are full of danger from disease. An experience of five years of constant travelling throughout every part of this district, at all seasons, and the full information I derived from my official situation, enable me to speak with more confidence on this subject than any other European yet can do, from the want of the same opportunities of improving his knowledge. I will not enter into every detail with which I am acquainted, but shall rest contented with such prominent facts as seem to deserve most notice. I shall first speak of the hills on the north, through which there are only three passes of consequence, but all equally fatal. The road leading by Sindwa is that which is most frequented. In the year 1818 a regiment of native infantry, 600 strong, and 24 European artillerymen, formed the garrison of Sindwa, and a body of 50 cavalry and 200 irregular infantry were posted to protect the pass.* In August, the whole were in excellent health; in October, one-third of the regiment, and nearly all the artillerymen, were dead of fever, the irregulars deserted their post after having lost the greater part of their number; and when the native regiment was relieved, early in November, it moved a complete hospital. There was not one man for duty. The doctor and all his native assistants were dead, and but two of the European officers escaped death. Since that period till December 1827, a period of nine years,

* The first division of the Deccan Army, with which we were serving, passed through this district in February, and left the detachment alluded to in perfect health, as stated above.

I only know of two officers who passed through those hills in the unhealthy months who did not die, and both those persons were saturated with calomel, and probably resisted the infection on that account.

“In the woods bordering on the southern hills, also, there is much danger. It was in their vicinity that the army of the Duke of Wellington was left, under the command of Colonel Haliburton, in the autumn of 1804, when it suffered so severely; and the tomb of their leader points out to the traveller the fatal spot of encampment,—at once forming a testimony of the attachment of his brother-officers who erected it, and serving as a warning to deter others from occupying that pestilential soil.

“On the western limit of Candeish I have already described Banglana as the woody region intervening between it and the coast. The climate of Banglana is as salubrious and agreeable in the healthy season as it is fatal during the autumnal months. In the year 1819, a detachment of fifty sepoy and an European officer passed through the forest of Nowapoor to Surat in September, and returned in October. The whole of the sepoy were affected with fever, and the officer died. In the following year, sixty men performed the same duty at the same season, nearly all of whom died. The officer escaped, after a lingering illness, with his life. At the same time, also, a detachment of His Majesty's 67th foot, consisting of five officers and twenty-two privates, marched from Surat to Candeish, of whom one officer and a private only survived; the whole of the rest died within a fortnight of their arrival at the head-quarters of the regiment. All the Europeans who have passed by this route within the last nine years, in the unhealthy months, have invariably died. The disease which affects them is a violent bilious remittent fever, which usually carries off the patient in a few days, in spite of the earliest and most skilful medical aid.

“Quitting Candeish, we pass into the north-west corner of the peninsula, denominated Guzerat, in which I include all the territory under Bombay north of Surat. The eastern limit is marked by the forests of Nandode, Rajpeepla, and the hilly and woody tract running north to Dongurpoor; from whence an equally rough track proceeds to the westward till we come to the Desert, near the frontier of which are Deesa and Palampoor, the most northerly positions of the Bombay army. As the Peninsula of Kattywar differs materially in its topographical features from the remainder of the country embraced within the limits I have now described, I exclude it for the present from the general description of Guzerat. This country is, for the most part, flat, abounding in fertilising streams, and is described as being every where richly cultivated, with a wealthy and substantial peasantry. It is, however, notoriously unhealthy in the autumnal months; and though not so fatal as the malignant jungles of Candeish, it seems to have been, from the time we first entered it in 1803, extremely fatal to Europeans. Kattywar, as I have before observed, differs from the rest of Guzerat in its superficial appearance only, but little in its climate, to the ill effects of which it is equally subject.

“Throughout the whole of the territory under the Bombay Presidency, it will be found that fever, whether remittent or intermittent, is the most common disease, while instances of inflammatory liver complaints occur less frequently. In some parts of the country, the Guinea-worm

makes its appearance through the skin in the rainy months; and although not fatal, proves often a painful and tedious disorder. Few persons, Europeans or natives, who have passed the rainy seasons in the artillery cantonment of Matoonga, on the island of Bombay, have escaped its effects; and it is a remarkable fact, that though individuals have not suffered during their stay at Matoonga for a few months, the worm has almost always made its appearance in the rainy season on the persons of those individuals, though absent many hundred miles, and at places where the Guinea-worm had never before been seen."

APPENDIX, No. III.

[See pp. 186—189.]

*MEDICAL RETURNS of the Army in some of the Colonies in the
West Indies.*

MEDICAL RETURNS

FOR

DEMERARA AND BERBICE, FOR 1823;

DEMERARA (ALONE), FOR 1824-5; AND DEMERARA AND ESQUEBO, FOR THE YEAR 1825.

[See p. 186.]

YEARS.	SEASONS OF THE YEAR.	Effective Strength.		FEVER.				PULMONARY COMPLAINTS.				DYSENTERY.				HEPATITIS.				DIARRHŒA.				Per-Centage of Admissions.				Per-Centage of Deaths upon Admissions.										
				Whites.		Blacks.		Whites.		Blacks.		Whites.		Blacks.		Whites.		Blacks.		Whites.		Blacks.																
		Europeans.	Natives.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.					Admitted.	Discharged.	Dead.				
1823	January, February, March .	637	160	135	122	5	7	7	-	24	21	-	6	4	-	21	18	-	5	4	1	1	1	-	-	-	4	3	-	-	21	4	3	-	21	4	3	-
	April, May, June	616	157	208	154	3	3	2	1	13	8	2	9	4	3	8	8	-	1	1	-	1	1	-	-	-	2	2	-	-	34	2	1½	-	34	2	1½	-
	July, August, September . .	509	201	461	403	11	13	13	-	64	51	2	17	14	2	22	20	-	-	-	-	-	-	-	-	-	-	-	-	90	12	14	-	90	12	14	-	
	October, November, December.	620	262	272	240	8	15	11	-	15	7	2	3	3	-	35	27	-	1	1	-	5	4	-	-	-	-	-	-	43	2½	5½	1	43	2½	5½	1	
	Average European Force, 596.	2382	730	1076	921	27	38	33	1	116	87	6	35	25	5	86	73	-	7	6	1	7	6	-	-	-	6	5	-	-	180	19	14½	½	180	19	14½	½
1824	January, February, March .	534	164	182	144	11	13	12	-	16	13	2	1	-	1	19	19	-	1	1	-	1	1	-	-	-	30	29	1	-	54	5	6	½	54	5	6	½
	April, May, June	501	210	222	184	5	14	13	1	8	5	1	3	2	-	5	3	1	-	-	-	2	1	-	-	-	3	3	-	-	45	1½	1	½	45	1½	1	½
	July, August, September . .	491	184	530	495	34	36	32	1	4	4	-	3	2	1	1	1	-	3	1	-	2	2	-	-	-	-	-	-	103	1	-	½	103	1	-	½	
	October, November, December.	1208	112	432	353	10	12	12	-	9	5	1	1	1	-	17	15	1	2	1	1	7	5	-	-	-	-	-	-	36	1	-	1½	36	1	-	1½	
	Average European Force, 634.	2534	770	1366	1176	60	75	69	2	37	27	4	8	5	2	42	38	2	6	3	1	12	9	-	-	-	33	32	1	-	212	6	6½	2	212	6	6½	2
1825	January, February, March .	1099	58	364	315	12	5	3	1	10	7	-	-	-	-	22	16	1	-	-	-	1	-	-	-	-	18	15	-	-	33	1	2	-	33	1	2	-
	April, May, June	1036	54	254	186	8	4	2	1	25	20	1	1	1	-	38	32	1	-	-	-	2	1	-	-	-	10	8	-	-	24½	2½	4	-	24½	2½	4	-
	July, August, September . .	929	58	577	473	37	10	6	3	20	14	3	-	-	-	40	34	2	-	-	-	6	3	2	-	-	11	11	-	-	62	2	4	¾	62	2	4	¾
	October, November, December.	875	56	359	220	12	-	-	-	27	22	4	1	-	1	51	27	10	-	-	-	3	2	1	-	1	39	35	-	-	41	3	6	½	41	3	6	½
	Average European Force, 985.	3939	226	1554	1194	69	19	11	5	82	63	8	2	1	1	151	109	14	-	-	-	12	6	3	1	-	1	78	69	-	-	157	8	15	1½	157	8	15

MEDICAL RETURNS
FOR
THE ISLAND OF TRINIDAD,
FOR

THREE YEARS, VIZ. FROM THE YEAR 1823 TO 1825 INCLUSIVE.

[See p. 187.]

YEARS.	SEASONS OF THE YEAR.	Effective Strength.		FEVER.						PULMONARY COMPLAINTS.						DYSENTERY.						HEPATITIS.						Per-Centage of Admissions.				Per-Centage of Deaths upon Admissions.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
				Whites.			Blacks.	Whites.			Blacks.	Whites.			Blacks.	Whites.			Blacks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
		Europeans.	Natives.	Admitted.	Discharged.	Dead.		Admitted.	Discharged.	Dead.		Admitted.	Discharged.	Dead.		Admitted.	Discharged.	Dead.		Admitted.	Discharged.	Dead.	Fever.	Pulmonary.	Dysentery.	Hepatitis.	Fever.	Pulmonary.	Dysentery.	Hepatitis.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
1823	January, February, March .	129	542	47	38	4	9	8	-	2	2	-	7	4	1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

MEDICAL RETURNS FOR THE ISLAND OF BARBADOES,

THREE YEARS, VIZ. FROM THE YEAR 1823 TO 1825 INCLUSIVE.
[See p. 188.]

YEARS.	SEASONS OF THE YEAR.	Effective Strength.		FEVER.						PULMONARY COMPLAINTS.						DYSENTERY.						HEPATITIS.				DIARRHŒA.				Per-Centage of Admissions.					Per-Centage of Deaths upon Admissions.												
		Europeans.	Natives.	Whites.			Blacks.			Whites.			Blacks.			Whites.			Blacks.			Whites.		Blacks.		Fever.	Pulmonary.	Dysentery.	Hepatitis.	Diarrhœa.	Fever.	Pulmonary.	Dysentery.	Hepatitis.	Diarrhœa.												
				Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.																							
1823	January, February, March .	769	666	67	52	-	18	12	-	26	22	1	26	17	4	42	34	-	6	4	-	14	11	-	3	3	-	12	9	-	20	18	-	64	31	51	2	14	-	5	-	-					
	April, May, June	744	714	92	77	-	49	39	-	22	14	2	30	24	2	53	40	1	4	3	1	6	4	-	4	3	-	29	24	-	12	10	-	12	3	7	1	4	-	10	2	-					
	July, August, September . .	689	714	79	74	-	79	77	1	34	19	1	140	131	5	37	34	1	2	1	1	5	4	1	8	8	-	67	56	-	29	26	1	12	5	5	1	10	-	1	3	-					
	October, November, December	964	588	47	37	1	22	22	-	10	7	1	22	18	1	21	6	3	4	2	-	5	4	-	6	6	-	62	59	-	19	17	-	5	1	2	4	6	-	10	30	-					
	Average European Force, 191.	3166	2682	285	240	1	168	150	1	92	62	5	418	190	12	153	114	5	16	10	2	30	23	1	21	20	-	170	148	-	80	71	1	36	12	19	4	21	-	6	4	3	-				
1824	January, February, March .	1227	588	147	127	6	11	11	-	12	7	2	86	71	2	22	17	2	14	12	1	37	30	1	16	14	-	263	219	1	13	12	1	11	1	2	3	21	4	17	10	-	1	-	1		
	April, May, June	1207	552	94	77	1	19	17	-	91	59	4	29	21	1	55	41	-	7	6	1	14	9	-	10	9	-	298	263	2	14	11	-	8	7	4	1	25	1	5	-	-	1	-	1		
	July, August, September . .	1169	542	80	68	2	28	22	1	13	8	3	31	24	4	26	20	3	16	8	1	15	11	3	7	7	-	249	225	2	14	11	-	7	1	2	1	21	3	23	12	20	1	-	1	-	1
	October, November, December	1114	721	69	47	2	26	24	-	72	54	4	22	11	3	9	8	-	16	15	-	3	2	-	4	2	-	132	107	2	15	14	-	6	6	1	-	12	3	5	-	-	1	-	1		
	Average European Force, 1179	4717	2403	390	319	11	84	74	1	188	128	13	168	127	10	112	86	5	53	41	3	69	52	4	37	32	-	942	814	7	56	48	1	33	16	10	6	79	3	8	5	6	1				
1825	January, February, March .	1190	400	66	55	1	19	7	1	53	36	10	33	27	3	4	2	1	3	3	-	7	5	-	7	7	-	94	79	2	18	16	-	5	4	-	8	2	20	25	-	3	-	3			
	April, May, June	1307	393	78	71	2	11	9	-	81	61	3	24	17	2	6	5	-	9	6	-	9	4	1	9	7	1	115	100	2	13	13	-	6	7	4	1	9	3	5	-	10	2	-	5	-	5
	July, August, September . .	1105	376	40	27	2	16	13	-	109	97	1	20	18	1	4	2	-	13	12	1	10	7	-	9	8	1	169	131	6	9	8	-	4	10	-	1	15	5	1	-	-	5	-	5		
	October, November, December	1089	390	66	45	1	19	17	1	58	36	10	33	27	3	4	2	1	3	3	-	7	5	-	7	7	-	94	79	2	18	16	-	6	5	1	1	8	2	20	25	-	2	-	2		
	Average European Force, 1173	4691	1559	250	198	6	65	46	2	301	230	24	110	89	9	18	11	2	28	24	1	33	21	1	32	29	2	472	389	12	58	53	-	21	25	1	3	40	2	8	11	4	3				

MEDICAL RETURNS

FOR

THE ISLAND OF SAINT LUCIA,

FOR

THREE YEARS, VIZ. FROM THE YEAR 1823 TO 1825 INCLUSIVE.

[See p. 189.]

YEARS.	SEASONS OF THE YEAR.	Effective Strength.		FEVER.				PULMONARY COMPLAINTS.				DYSENTERY.				HEPATITIS.				Per-Centage of Admissions.				Per-Centage of Deaths upon Admissions.						
				Whites.		Blacks.		Whites.		Blacks.		Whites.		Blacks.		Whites.		Blacks.												
		Europeans.	Natives.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Admitted.	Discharged.	Dead.	Fever.	Pulmonary.	Dysentery.	Hepatitis.					
1823	January, February, March .	259	407	93	59	24	23	19	-	11	4	3	2	-	1	1	-	-	-	-	-	-	36	8	1	-	26	-	50	-
	April, May, June	238	380	89	60	19	13	11	1	8	9	4	5	4	-	1	-	-	-	-	-	-	37½	3½	2	-	21	-	-	-
	July, August, September . .	234	391	67	55	8	20	16	-	6	7	3	2	1	1	4	4	-	-	-	-	-	29	3	1	-	12	-	-	50
	October, November, December	228	374	39	37	-	22	15	1	5	10	-	3	2	-	4	4	-	-	-	-	-	17	2	1½	-	-	20	-	-
	Average European Force, 240.	959	1552	288	211	51	78	61	2	39	26	9	12	7	2	10	9	-	-	-	-	-	120	16	5	-	18	3	17	-
1824	January, February, March .	101	466	26	20	2	26	23	-	3	25	2	23	18	2	4	3	-	2	1	2	1	26	3	23	2	8	33	8	50
	April, May, June	152	427	45	31	-	33	26	1	4	23	1	19	18	-	14	8	3	3	3	3	1	30	3	12½	1½	-	-	-	-
	July, August, September . .	147	425	41	38	1	22	13	1	6	91	4	10	7	-	3	3	-	-	-	-	28	4	7	-	3	-	-	-	
	October, November, December	139	412	42	22	10	42	38	-	8	13	5	4	3	-	2	1	-	-	-	-	30	6	3	-	24	-	-	-	
	Average European Force, 135.	539	1730	154	111	13	123	100	2	21	152	12	56	46	2	23	15	3	5	4	1	6	114	16	4½	4	8	5	4	20
1825	January, February, March .	221	363	36	29	4	37	31	-	6	17	1	6	4	-	1	1	-	-	-	-	16	3	3	-	8	-	-	-	
	April, May, June	198	372	56	49	2	39	34	1	9	15	-	14	10	1	3	1	1	-	-	-	23	5	7	-	4	11	7	-	
	July, August, September . .	194	384	69	65	1	33	30	1	9	12	2	9	5	1	7	5	1	3	2	-	35	5	5	1½	2	-	10	-	
	October, November, December	187	305	42	33	3	30	21	-	5	18	-	8	3	2	1	1	-	1	1	-	23	3	4½	½	7	12	-	-	
	Average European Force, 200.	800	1429	203	176	10	139	116	2	29	62	3	37	22	4	12	8	2	4	3	-	100	15	19½	2	5	4	3	-	-

MEDICAL RETURNS
FOR
THE ISLAND OF JAMAICA,
FOR THREE YEARS, VIZ. FROM 1823 TO 1825 INCLUSIVE.
[See p. 189.]

YEARS.	SEASONS OF THE YEAR.	Effective Strength.	FEVER.			PULMONARY COMPLAINTS.			DYSENTERY.			HEPATITIS.			DIARRHŒA.			Per-Centage of Admissions.					Per-Centage of Deaths upon Admissions.					
			Whites.	Europeans.	Dead.	Whites.	Europeans.	Dead.	Whites.	Europeans.	Dead.	Whites.	Europeans.	Dead.														
1823	January, February, March .	2475	Admitted.	595	467	59	54	44	3	111	89	2	3	1	-	31	28	-	24	2	4½	-	1½	10	6	2	-	-
	April, May, June	2492	Discharged.	334	281	11	76	69	2	96	71	3	13	7	-	76	72	-	13½	3	4	½	3	3	3	4	-	-
	July, August, September . .	2468		303	250	18	102	85	2	94	75	4	17	14	-	39	37	-	12½	4	4	¾	1½	2	2	4	-	-
	October, November, December.	2437		496	393	32	120	106	4	58	49	1	20	13	2	13	12	-	20½	5	2½	1	6½	7	4	2	10	-
	Average European Force, 2468.	9872		1728	1391	120	352	304	11	359	284	10	53	35	2	159	149	-	70	14	14½	2	6½	7	3	3	4	-
1824	January, February, March .	2337		569	445	61	131	97	5	35	28	2	14	6	2	43	39	-	24	6	1½	1	2	11	4	6	14	-
	April, May, June	3104		545	459	24	124	107	3	72	63	2	22	17	-	61	50	-	17	4	2½	1	2	4½	3	3	-	-
	July, August, September . .	3015		721	593	58	112	89	3	104	96	2	16	13	-	84	81	-	23	4	3	½	3	8	3	2	-	-
	October, November, December.	2946		599	488	37	102	78	4	80	69	4	20	10	2	49	45	-	20	3½	3	1	1½	6	4	6	-	-
	Average European Force, 2880.	11402		2434	1985	180	469	371	15	291	256	10	72	46	4	237	215	-	86	16	10	3	8	7½	3	3	6	-
1825	January, February, March .	3026		948	732	116	74	57	6	75	63	5	22	21	-	117	106	-	31	2½	2½	1	4	12	8	6	-	-
	April, May, June	2733		739	575	89	72	64	1	104	95	1	5	4	-	138	126	-	27	2¾	4	-	5	12	1	1	-	-
	July, August, September . .	2763		1207	785	223	71	59	4	94	83	7	4	2	2	103	101	-	44	3	3½	-	4	15	5	7	50	-
	October, November, December.	2266		1175	765	295	41	32	7	42	36	3	5	5	-	51	45	-	52	1¾	1¾	2¼	26	15	4	-	-	-
	Average European Force, 2682.	10728		4069	2857	723	258	212	18	315	277	16	36	32	2	409	378	-	152	10	11½	1½	15	18	7	5	50	6

APPENDIX TO THE CASES.

SEE THE SECTIONS ON ACCUMULATIONS OF BILE AND CONGESTION OF THE LIVER, p. 326.

CASE CXXXI. — *Uncommonly great Congestion of the Liver and Accumulation in the Gall-Bladder ; Black Jaundice : Introsusceptions of the Small Intestines.*—(See Plate XXI.)

SERJEANT MURBEY, ætat. 42, an excessively hard drinker, was brought to the General Hospital at Madras 12th February 1822, in the evening. He had been attacked some days since with vomiting and purging, and has been taking medicines from some native doctor ; but as these symptoms continued, he was alarmed, and came to the hospital. His skin is covered with a cold, clammy perspiration ; pulse feeble ; tongue moist, but very much furred ; vomiting continues, and he complains of sharp pain at the epigastric region.—Twelve leeches were immediately applied to the epigastrium, the effervescent mixture given, and twenty grains of calomel with two of opium at bed-time, and ʒj. pulv. jalap. comp. early in the morning.

13th. — Has had several copious, black dejections, and has passed a good deal of urine ; feels much better ; skin more natural ; pulse 74, and regular ; tongue as last night ; feels some uneasiness at the lower part of his belly. — Foment the abdomen. Enema domest.

Evening.— Has been fully evacuated, and the motions are extremely morbid and offensive ; says he feels feverish heat, but the skin is not warm, nor is the pulse quickened.— Repet. pilul. calom. et mist. salin. febrif. comp. every two hours.

14th.— Had some vomiting in the night ; skin rather hot and dry ; tongue much loaded ; considerable thirst, and some headach ; motions watery, and almost black—dark brown.—Apply a blister to the pit of the stomach. Haust. amar. cum sennâ, ʒiij.

Evening.—Motions precisely the same, excessively offensive ; voids his urine copiously ; still nausea ; pulse 80 ; skin cold and clammy ; refuses all nourishment ; his countenance is dejected ; the blister is doing its duty.—R Pilul. calom. cum aloë. no. l. ter in die. R Mist. amar. cum sennâ, ʒij. nocte maneque. Arrow-root and sago for diet, and dilute nitrous acid, to drink occasionally.

15th.—Pulse 70, rather small ; skin more natural ; tongue much cleaner and less excited ; no motions since last report, and only vomited once ; he passed a good night ; countenance improved ; took some arrow-root and wine, which remained on his stomach ; the blister has risen well. — Cont. omnia.

17th.— There is no alteration, either for the better or the worse, but he complains of sharp pain at the lower part of his throat. — Five leeches were applied to the part, which relieved him immediately. Cont. med.

19th.—Passed a restless night, and complains of a considerable degree of sickness at stomach, with tightness about his throat that distresses him; his eyes have a yellow tinge, and his urine is highly coloured; motions green; pulse 80, firm; skin warm and moist; has no pain in the region of the liver; considerable thirst; tongue moist and pretty clean; countenance anxious.—Continue as before. Rub the throat with volat. liniment, and apply flannel. Diet, arrow-root and wine, chicken soup, or tea, as suits his fancy.—N.B. His urine is extremely yellow, and scalds him in passing it.

20th.—The whole surface of the body and eyes have become extremely dark and yellow; motions liquid, and quite green; tongue covered with brown fur, and moist; complains of burning sensation in the region of the stomach, but no pain any where; less nausea; on the whole, he appears better; skin cool; pulse 80.—R Pilul. hydrarg., calom. āā gr. iij.; pulv. ipecac. gr. jss.; syr. q. s. Ft. pilul. ter die sumend. Repet. mist. amar. cum sennâ, 3ij. nocte maneque. Omit acid drink. Apply the nitro-muriatic lotion to the epigastric and hypochondriac regions, and a large poultice over the whole, to be renewed often.

21st.—Complains of nausea; motions watery and green; pulse soft, 86.—Cont. omnia.

22d.—His urine is scanty, and very high coloured; complains of a very foul, disagreeable taste in his mouth; tongue foul, loaded, and brown; no tension of the abdomen; no inclination to take food.

Evening.—Says he cannot void his urine, and complains of being excessively cold; tongue dry.—Mist. salin. febrif. cum spirit. æther. nitros. every two hours. Cont. ut antea.

23d.—Passed his urine very well, and says he is better; but there is something extraordinary in the case, and he does not improve; the excretions are uncommonly morbid, and there is a weight and oppression about him, though he does not complain, which prove great danger.—Continue his medicine, and give him imperial to drink.

25th.—No material change; says he is very weak and ill, but he cannot describe his symptoms; he has no appetite; his countenance is anxious and dejected; considerable tension in the lower part of the abdomen, over the pubes, from distension of the bladder, and he has made very little urine. About 1lbj. of very dark-coloured urine was drawn off by a catheter; the belly became perfectly soft immediately, and he was seized with syncope.—R Mist. camph. 3j.; spt. æther. vitriol. 3ss. M. stat. Foment the belly. Discontinue the pills. Repet. haust. amar. cum sennâ.

Evening.—Bladder very much distended, and about four pounds of urine drawn off; he does not complain of any pain; tongue foul, black, and dry.—Enema domest. statim. Foment the belly. Repet. mist. salin. febrif. ut antea.

26th.—Voided his urine very well during this day, and there is no tension in the abdomen; purged freely; dejections dark-green colour, and tenacious; excessive debility; drowsy and sleepy; countenance sunk and dejected; takes very little nourishment.—Cont. ut antea.

27th.—Says he is very ill, but he has no pain any where; passes his motions involuntarily; they are extremely viscid, black green, and tenacious; pulse 76, firm, and regular; skin warm and moist; tongue dry and brown; six pounds of urine drawn off by the catheter.—R Capsici, gr. iij.; cons. rosæ, q. s. Ft. pilul.; one every two hours.

Evening.—Has tension over the abdomen, and has not passed urine since morning; thirty ounces were drawn by a catheter.

28th.—Has passed his urine this day very well; complains of a soreness in his mouth and throat,

not unlike a scorbutic affection. — Garg. alum., and give the diluted nitrous acid again. Repet. pilul. capsici.

Evening. — Considerable bleeding from his nose; three pounds of urine drawn off. — Cont. ut antea.

March 1st. — Has passed a great deal of black, viscid matter by stool involuntarily; he can scarcely answer questions; pulse calm, soft, and about 80; he cannot be prevailed upon to take nourishment; there are several black, dry scabs upon the lips and nose. — Apply the nitro-muriatic lotion to the sores, and use it as a gargle.

2d. — The nitro-muriatic lotion has had an excellent effect in removing a considerable quantity of black, bloody matter from the gums and tongue, and the sores on the nose and lips appear cleaned by it; voids his urine in very small quantity; three pounds and a half were drawn off. The symptoms did not vary in any degree, and he sunk under them on the 8th March.

The skin became almost black, and continued so during the last fortnight of his illness; and the whole period of his being in hospital, the motions were morbid, crude, sometimes green, and black. The most distressing symptom was the retention of urine. The spongy nature of his gums must have been the consequence of debility and loss of power in the extreme vessels. The symptoms shewed general disturbance in the constitution, but did not mark any specific form of disease: even the most distressing symptoms gave little correct information as to the precise nature of the case. The object was to remove morbid accumulations, to correct the morbid state of the liver and the secretions, and to support his strength. His almost abhorrence to food and nourishment opposed the latter; and although the former indication was acted upon, there was at no time any improvement visible.

On Examination after Death, (see Plate XXI.) the liver was very much enlarged, and perfectly black; and when cut into, exhibited a similar appearance. The gall-bladder was amazingly enlarged, and full of black or dark-green ropy bile. The colon was contracted in a most extraordinary manner throughout its course to the rectum, thickened in its coats, and lined with viscid matter. Two intussusceptions were discovered in the small intestines, in one of which seven inches of the gut were contained in four inches; so that the passage must have been completely closed. The bladder was not diseased, but more flaccid than it usually is. The thoracic viscera were healthy.

CASE CXXXII. — *Acute Hepatitis; Abscess opening into the Colon. — Recovery.*

[See the Section on Abscess of the Liver, p. 516.]

ANTHONY BRAPSON, Eighth Company, ætat. 22, admitted 9th November, 1816, at Kurnool. Complaints of pain in his head and side; eyes reddish; pulse small, 108; tongue foul; bowels costive; nausea. — Apply twenty leeches to his side. Haust. emet.

10th. — Rather better this morning; the pain in his side much easier; pain in the head still continues; tongue foul; pulse 99; breathes with difficulty. — V. S. ad $\bar{5}$ vj. Apply twelve leeches to the abdomen, and eight leeches to each temple. Ol. ricini, $\bar{3}$ ij. Enema purg.

Vespere. — Pulse 120, strong; difficulty of breathing; tongue red. — Apply twenty leeches to the chest. V. S. ad $\bar{3}$ xviiij. Calom. gr. xv. h. s. Ol. ricini, $\bar{3}$ ij. p. m. s. Mist. salin. repet.

11th. — Rather better this morning; pulse 105, weak; skin cool; stools copious, fluid, of a brick colour; tongue foul. — Cont. mist. Calom. gr. xx. h. s. Ol. ricini, ʒiij. p. m. s. Apply a small blister to each temple.

12th. — Complains of severe pain in his back; skin cool; pulse 90, soft; stools yellow and copious; tongue moist, but brown. — Apply eighteen leeches to the back, on the part pained. Calom. gr. xx., et horas post tres, ol. ricini, ʒiij. Cont. mist.

Vespere. — Pulse 102; tongue dry and brown; stools frothy, of a yellow colour; complains of pain in the lower part of the thorax; his head is much relieved. — Apply twelve leeches to the part pained. Calom. gr. xx. h. s. Ol. ricini, ʒiij. p. m. s. Mist. salin. Sago and milk for supper.

13th. — Pulse 92, full, and strong; tongue dark yellow; stools yellow and green; the pain in his chest is much diminished. — Apply twenty leeches to his right side. Calom. gr. xx. Ol. ricini, ʒiij. Cont. mist.

Vespere. — Complains of more pain in the side; pulse 105 in a minute; stools of a beautiful green colour; has the sensation, he says, of something sticking in his side, and interrupting his breathing; tongue yellow. — Apply a large blister to his side. Calom. gr. xx.; pulv. antim. gr. v. M. h. s. s.

14th. — Pulse 90; tongue yellow; pain in his side continues; no stool since yesterday evening. — Calom. gr. xv. Ol. ricini, ʒiij. Enema purg.

Vespere. — Pulse 96; complains of soreness in his chest; stools of a dark-green colour; tongue still yellow, but more moist; mouth affected by mercury. — Apply a blister over the chest. Ol. ricini, ʒij. Mist. salin.

15th. — Pulse 108 in a minute; pain in his chest easier this morning; tongue still yellow. — Magnes. sulph. ʒvj.; aquæ menth. pip. lbss. M. ft. haust. Enema purg.

Vespere. — Pulse 102 in a minute; pain in the chest better; stools of a green colour; his mouth affected. — Mist. salin.

16th. — Pulse 96 in a minute; pain in his chest rather less; stools brown. — Mist. purg. till it operates well.

Vespere. — The salts have purged him freely, and he feels much relieved; pulse 108 in a minute; skin rather hot and dry; great thirst. — Mist. salin. cum vin. antim.

17th. — Pulse 99 in a minute; tongue quite yellow; stools yellow, with feculent matter; pain in his back; skin dry. — Apply eight leeches to his back. Mist. salin. with mag. sulphat.

Vespere. — Pain in his back easier; pulse 102 in a minute; feels pain in the epigastrium; medicine this morning operated up and down; stools watery, with a red tinge. — Calom. gr. xij.; pulv. antim. gr. jv. M. ft. pil. h. s. s. Mist. salin. with antimonial wine. Dress the blister on the chest with ung. lyttæ.

18th. — Pulse 102 in a minute; stools scanty, watery, and of a reddish-brown colour; pain gone from the epigastrium; tongue yellow, but cleaner. — Mist. purg. with magnes. sulph. Cont. mist. salin. Calom. gr. xv. h. s.

19th. — Pulse 90; stools of a reddish-brown colour; feels much easier in his chest; tongue brownish yellow. — Mist. purg. cum magnes. sulph. R Pilul. hydr. ʒss.; calom. ʒj.; pulv. antim. gr. xv.; syrup. q. s. Ft. pilul. no. 9.; take one three times a day. — Cont. mist. salin. febrif. Rub in ʒj. unguent. hydr. Calom. gr. xv. h. s.

20th.—Tongue much furred and brown, but moist; mouth sore, with the mercurial fœtor; considerable thirst; still has soreness in the thorax, but when he takes a full inspiration he feels pain in the region of the liver; he also feels pain on pressure high up under the ribs, close to the vertebræ; pulse small and sharp, 94 in a minute.—Apply eight leeches to the pained part immediately. Mist. purg. $\bar{3}$ jv. Enema purg. Cont. frictio and pills, as before. Mist. salin. febrif.

Vespere.—The leeches bled well, but he does not feel any relief; the pain continues; tongue the same; well purged; pulse 90; stools green, bilious matter, with a quantity of tenacious mucus.—Cont. pilul. ut antea. Repet. enema. Calom. gr. xij.; opii puri, gr. ij.; syrup. q. s. Ft. pilul. h. s. s.

21st.—Pulse 90, soft and full; passed a restless night; was not much purged; says the pain in his side is easier; but he has a teasing cough, and breathes with some difficulty, evidently from the liver pressing upon the diaphragm; tongue foul, and loaded with a deep crust; mouth sore.—Mist. purg. $\bar{3}$ jv. Enema purg. Cont. pilul. ut antea. Cont. mist. ut antea. Garg. alum.

Vespere.—Stools mucous and watery; no fæces; pulse 94, weaker; tongue cleaner and moist; feels pain in the right hypochondrium when he breathes, which he says is acute.—Apply ten leeches. Calom. gr. xx. h. s. s. Enema purg. Cont. mist. salin. Sugee for breakfast; chicken for dinner; sago for supper.

22d.—Skin cool and moist; pulse 96, not full or strong; tongue moist and cleaner; says he feels a burning heat over him; was purged after the enema, which he always requires to produce any effect upon his bowels.—Enema purg. Omit. mist. salin. R Mist. camph. lbj.; spirit. æther. nitros. $\bar{3}$ ss.; aquæ ammon. carb. $\bar{3}$ ss. M.; a wine-glassful every hour. Rub in $\bar{5}$ j. unguent. mercur. and gr. x. camph. over the belly, night and morning. Cont. pilul. calom. cum pulv. ant.

23d.—Pulse 98; feels much better, and thinks the mixture has been of great use to him; stools watery, with lumps of white, glairy mucus; tongue cleaner; cough and pain much easier.—Mist. purg. $\bar{3}$ jv.; magnes. vitriol. $\bar{3}$ jv. M. ft. mist. haust. sumend. Cont. frictio, mist. camph., and pills, as before. Enema purg.

24th.—The pain in his side and cough are rather more troublesome this evening; pulse 98 in a minute; had two or three stools in the day.—Apply eight leeches to his side. Pilul. cum extract. colocynth., calom., et. pulv. antim., ter die. Cont. mist. camph. ut antea.

25th.—Pulse 88; feels better; the leeches have relieved him much; he feels less heat than usual; alvine evacuations still very imperfect; tongue loaded with whitish-yellow mucus, but has completely lost the brown crust; skin pleasantly warm.—Mist. purg. $\bar{3}$ j. ut antea. Cont. pilul. heri præscript. Enema and mist. camph. ut antea. A seton in his side.

27th.—Cough very troublesome, in other respects no material change.—Cont. pilul. ut antea. R Tinct. opii camph. $\bar{3}$ ss.; spirit. æther. nitros. $\bar{5}$ j.; aquæ puræ, $\bar{3}$ ij. M. ft. haust.

28th.—Pulse 82, quite regular; pain in his side much easier; mouth continues very sore; cough still troublesome, and he feels the sensation of want of room to breathe, which must arise from the pressure of the liver on the diaphragm; his stools are feculent and bilious, of a greenish colour; the blister on his chest is healed; the seton is discharging very well.—Repeat the blister to his chest, as before. Cont. pilul. ut antea. Cont. mist. ut antea. Pulv. purg.

30th.—Pulse 82 in a minute; tongue clean and natural; breathes with difficulty; the cough is

troublesome; felt a sharp pain under the right breast, which only remained a short time. — Apply eight leeches to the part. Cont. mist. camph. ut antea. Mist. purg. ℥ij.; sal. cathart. ℥ss. M.

Vespere. — Felt a sickness at stomach, which has exhausted him very much; pulse soft and full, but intermits; felt no pain; has been well purged; feels very weak; pain in his side is diminished by the leeches, but he still breathes with difficulty, and the cough is troublesome. — R. Tinct. opii camph. ℥ss.; aquæ ammon. ℥xxx.; aquæ puræ, ℥ss. M. ft. haust. h. s. s. One glass of wine.

December 1st. — Feels less pain; the cough still continues; his tongue is dry at the root, and he seems to be oppressed, and speaks and breathes short; pulse 80, but rather weak. — Omit. mist. camph. R. Mist. salin. febrif. ℥bj.; spirit. æther. nitros. ℥ss.; spirit. æther. vitriol. ʒij.; tinct. opii camph. ℥j. M.; a wine-glassful every hour. Cont. pilul. purg. bis die. Two glasses of wine a day.

5th. — Complains of pain in the back; there is nothing to be seen or felt, but it is increased on pressure; his pulse is not quick or hard; the cough is very distressing; stools more natural. — Apply eight leeches to the part pained. Cont. mist. camph. ℥bj. cum tinct. opii, ʒj. Cont. pilul. &c. &c. Three glasses of wine.

Vespere. — Much relieved from the application of leeches; spits a great deal of mucus, and, to use his own word, “corruption,” and passed the same by stool; has felt much easier since, and his cough is better; pulse small and quick, 96; have not seen what was passed by the mouth. Cont. mist. camph. cum tinct. opii, ut antea. Cont. pilul. h. s. s.

7th. — Spits up a great deal of mucus; stools nearly white, and like melted butter; feels weak. — Cont. omnia.

The symptoms and treatment varied but little till the 15th, when the following report was given: — His stools have changed colour, and have a purulent and more bloody appearance; he strains a good deal; tongue rather dry; pulse 90, small and weak; the pain in his side is easier, and thinks the matter discharged gives him relief; he has much less pain in the back; his appetite is not so good; stools have the appearance of an abscess having opened into the bowels. — Enema anodyn. stat. Cont. Beef soup, and a glass of wine at ten o'clock, twelve, three, and at six. Haust. anodyn. h. s. s. etiam enema anodyn.

16th. — Pulse 90, very small and weak; stools liquid, with some blood and pus; the pain in the chest and side is much diminished, but he feels pain along the spine from the fifth rib to his loins; tongue rather dry; skin cool; debility is great, and there can be no doubt that an abscess has broken into the colon; he had sickness of stomach all yesterday. — Enema anodyn. R. Mist. salin. febrif. ℥bj.; spirit. æther. vitriol. ℥ss.; tinct. opii, ʒj.; aquæ ammon. ʒj. M. ft. mist.; a large spoonful every two or three hours. Cont. diet.

19th. — Pulse 100, and small; has passed a tolerable good night; is easy, but says he feels a lump in his stomach, which moves when he takes any thing, and gives him heartburn; he also feels fulness under the right ribs; has had stools of a muddy, green appearance; no blood. — R. Magnes. alb. ʒj.; pulv. rhæi, gr. x.; ol. anisi, ℥ij.; aquæ ammon. ℥xx.; aquæ puræ, ℥ij. M. ft. haust. Enema purg. Cont. diet as before. Enema anodyn. at twelve o'clock.

Vespere. — No material change; he feels the pain and fulness more general over the belly, but

there is not any fulness on examination; pulse 104; thinks the draught relieved the burning sensation in his stomach.—Repet. haust. ut antea. Repet. haust. anodyn. h. s. R Decoct. cort. lbj.; tinct. cort. ʒj.; acid. vitriol. mxxx. M.; a wine-glassful every two hours. Omit. mist. salin.

21st.—Pulse 104, and rather stronger; skin warm; says he feels much better; tongue still furred; does not feel so much “smothering” as he did, but he still complains of a lump which he often wishes to throw up, but cannot; pain along the spine much less; he is not so sick as he was, but he vomited some green bile last night; stools more feculent and less bloody.—Cont. decoct. cort. ut antea. Cont. diet, wine, &c.

25th.—Has been frequently purged; feels generally better and less pain, but very weak; appetite improved.—Repet. decoct. cort. ut antea. R Tinct. ferri muriat. mxx.; aquæ puræ, ʒj. M.; three times a day. Haust. anodyn. h. s. Cont. diet as yesterday. Mutton chops. Nitrous acid drink, wine, &c.

His symptoms and the treatment continued nearly as above till the 8th of January, when he passed some purulent matter in his stools, which were otherwise tolerably natural.

9th.—Felt a good deal of pain last night in the right side when he lay upon the left; and turning to the right side he felt something fall, with considerable force, as if there was something torn; feels easier while he lays in a horizontal posture, but when he sits up he has pain about the fifth rib; bowels regular.—Cont. omnia.

13th.—Improving; pains all removed.—Haust. amar. cum sennâ stat. Cont. med.

Vespere.—Has passed some pus in his stools, which are otherwise perfectly natural.—Cont. med.

14th.—Complains of pain in his side; pulse quick.—Apply eight leeches to his side.

Vespere.—Stools perfectly natural and formed; pulse good; tongue clean; pain in his side is better from the leeches.—Cont. med. ut antea.

15th.—Better than he has been yet; stools quite natural.—Cont. cort. et tinct. ferri, et acid. nitros. ut antea. Cont. diet.

From this time he improved gradually, and at last perfectly recovered.

END OF THE FIRST VOLUME.

